

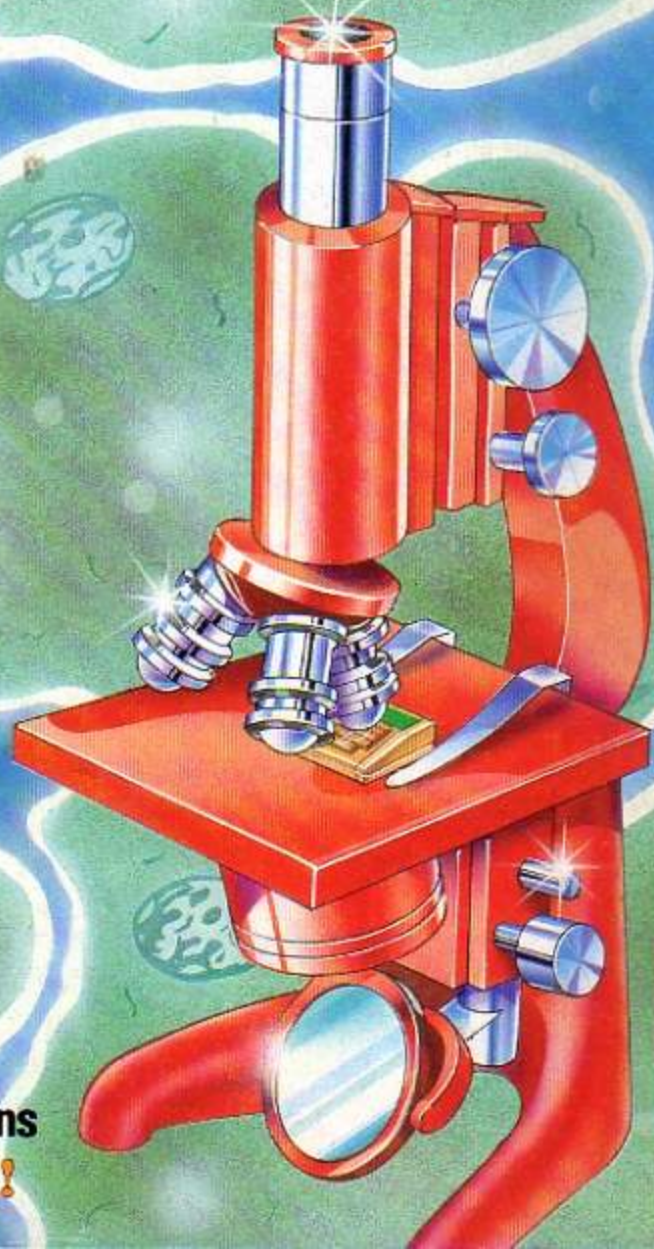
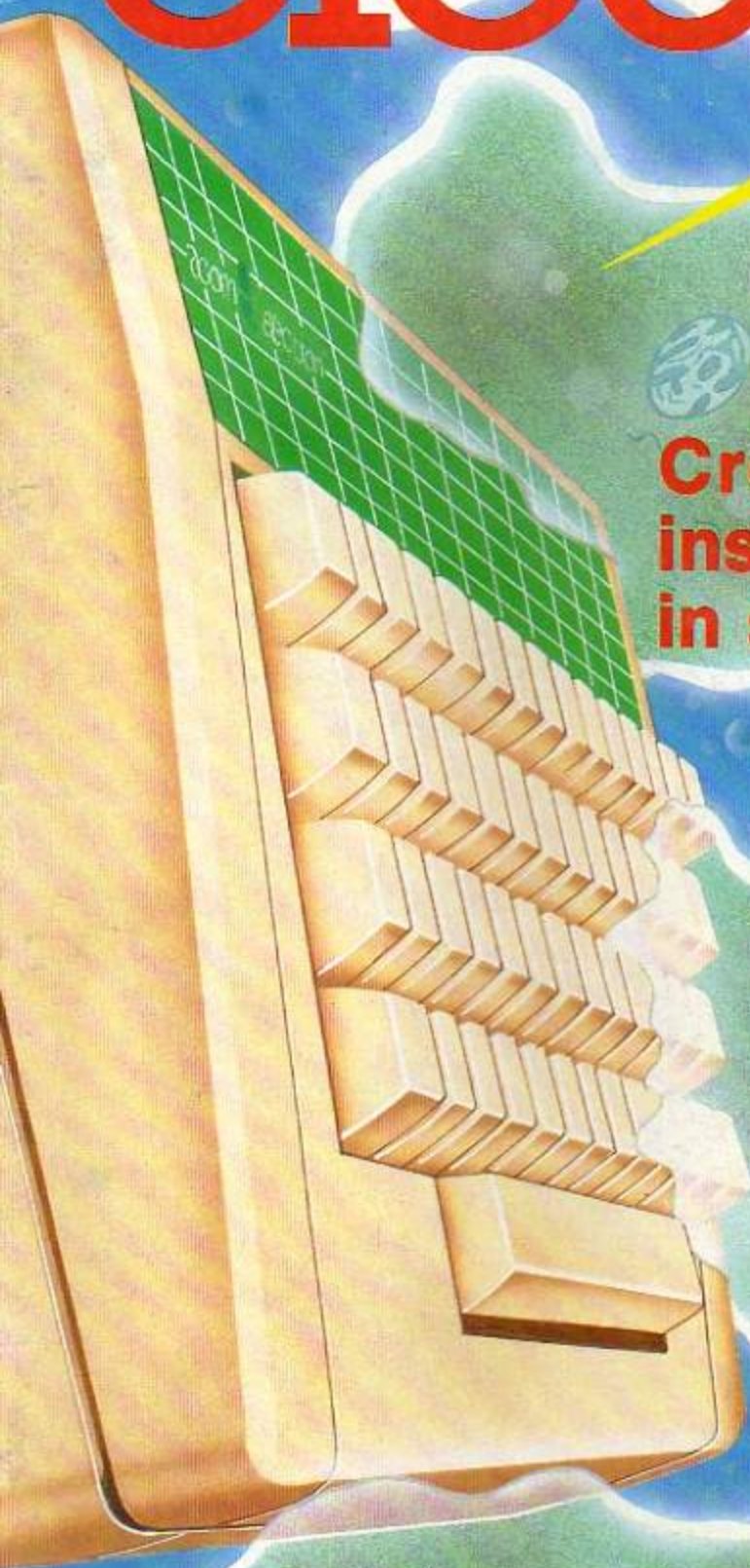
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A Database Publication

# electron user

Vol. 2 No. 8 May 1985 £1

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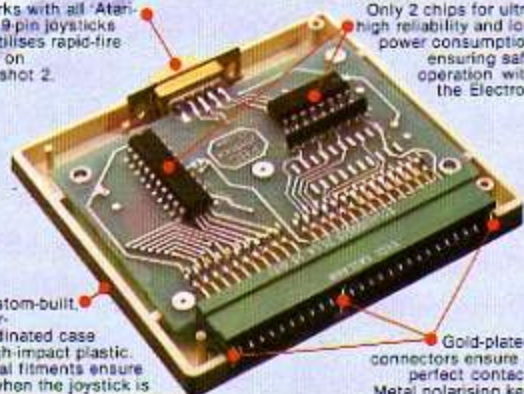
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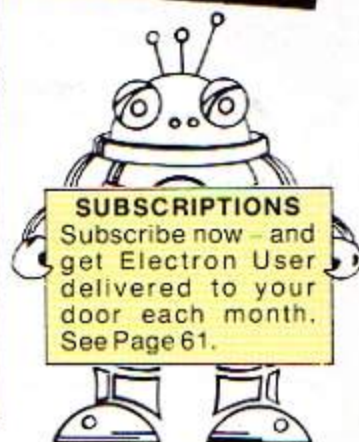
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# electron user NEWS

## Electron is due to move up market

**ACORN'S backroom boys are currently working on a master plan to take the Electron up market.**

Within the next few months, a series of "application bundles" will be released to increase the appeal of the machine to adults.

Although details are top secret at the moment, *Electron User* has learned that one of the first add-ons is likely to be a communications package.

"We are working to take the Electron into more sophisticated applications", admitted a company spokesman.

"And this may well

include areas such as on-line information access or home word processing".

However the man from Acorn went out of his way to firmly deny rumours that the company is planning to launch an enhanced version of the Electron.

"That is simply not on the cards", he insisted. "For the Electron in its present form is going to be around for a long time to come.

"Nor are there any further price cuts planned for the machine".

The company is hoping that rumours which have been constantly springing up

about the future of the Electron have been finally laid to rest.

"We have repeatedly tried to hammer home the message that the Electron is here to stay", said the Acorn spokesman.

"It has been stated categorically that the machine will be in production until the end of 1986. Well, in terms of the fast moving computer industry, that is almost like saying forever.

"There is not one other manufacturer on the market to publicly state that any of its products will be around in 18 months..."

THE Electron has jumped from number three to share the number two spot in the UK's best selling home computer league.

According to the latest figures from AGB, the market research organisation, it is now joint second with the Commodore 64 and is catching up fast on the pole position Spectrum.

The survey shows that both the Electron and the Commodore 64 took 15 per cent of the market share, with the Spectrum accounting for 28 per cent.

Compared to the same report released 12 months ago, sales of the Electron have shown a spectacular 13 per cent increase.

This is compared to the Commodore 64 which could only manage a one per cent increase on the previous year while Sinclair Spectrum sales in fact slumped by six per cent.

Thanks to the pacesetter performance of the Electron, the AGB statistics show that Acorn's market

**NOW  
WE  
ARE  
No. 2**

share jumped from eight per cent to an all time high of 21 per cent.

"We are delighted with the results", an Acorn spokesman told *Electron User*. "For the Electron has been outstripping all its competitors in percentage terms.

"If it keeps on course, it will be ahead of the Spectrum by the end of the year".

Yet more good news for Acorn came recently from the prestigious *Which?* magazine. It chose the Electron as the joint best buy for first time home computer owners along with the Spectrum.

## The accent on education

A COLLECTION of educational programs covering all levels from pre-school to sixth form has been brought together on a single cassette for the Electron.

Called Classroom Computing, it has been

adapted from a best selling educational package originally produced for the BBC Micro.

It contains 15 full-length programs designed to teach in a stimulating and entertaining way, in school

and at home.

The scope of the programs ranges from pre-reading to sixth form maths and all of them have been tested in a classroom environment.

The programs are complete in themselves

and contain all the necessary instructions, but additional helpful information is contained in a companion book.

This carries more detailed descriptions of the programs - complete listings of all 15, together with advice on

how they can be adapted to individual requirements.

Classroom Computing on the Electron costs £5.95 and the book £1.95. Ordered together they cost £7.

● See the order form on Page 61.



## New at the big show

THE first of this year's three Electron & BBC Micro User Shows has been chosen as the launching pad for two major educational programs.

Acornsoft is to unveil both Workshop and Talkback at the show, to be held in the New Horticultural Hall, Westminster, London from May 9 to 10.

"We wanted to let people know that we are aware of their concern about educational programs for the Electron", an Acorn spokesman told *Electron User*.

"So what better way than to launch two new packages for the machine at this major event".

### Chatting

"Workshop enables students to simulate taking a piece of material and performing tasks with it, while Talkback offers an opportunity to converse with the micro".

The May show will also provide the first opportunity for the public to see Cumana's Electron disc interface.

Advance ticket sales for the London spectacular have never been heavier, and a number of major standholders have announced they intend to use it as a springboard for exciting – but as yet top secret – new products.

"Once again we are hoping to break attendance records", says Derek Meakin, head of Database, the organisers.

The two other Electron and BBC Micro User Shows this year are to be held in UMIST, Manchester, September 27 to 29 and the New Horticultural Hall from November 14 to 17.

# Calling all asteroids...

ELECTRONS intended to help fight crime in the streets have been used to battle aliens in space instead.

So now the police force concerned has told its officers: "No more star wars on the station micro".

The story came to light after Viewfax, the Prestel information service, reported that the Metropolitan Police had banned officers from using their own micros

in connection with police work.

This was because some London bobbies were taking home cassettes and discs containing crime statistics and records to try to identify patterns of criminal activity.

Met chiefs didn't mind the enthusiastic officers doing "home-work", but felt the removal of software from police premises constituted a security

risk. Cassettes and floppies might be mislaid in transit or inadvertently seen by persons outside the force.

News of this ban was seen by an anonymous Viewfax "grass" who had his own inside story about police computing.

One Midlands force, he revealed, has had to crack down on misuse of Electrons provided to help the crime busters in their work.

The force concerned

had supplied the CID sections at its stations with Electrons equipped with disc drives.

But as well as using the machines to help track down criminals the detectives were using them to smash gangs of Thargoids and other offending aliens.

Result: a rap on the knuckles for those involved and orders to use the Electrons to fight crime instead of intergalactic wars.



Spearheading the German invasion: the Waltham MC3810

## New data on tape system

A GERMAN data recorder – already the leader in its home country – is poised to invade the booming Electron sector in the UK.

The MC 3810 from Waltham Electronics of Munich is purpose built to offer full compatibility with the machine. It costs £25.95, plus £3.95 for the Electron interface.

Power supply units cost an additional £4.95.

"It is designed specifically as a data recorder, so offering a real alternative to the audio cassettes home computer owners so often use", says Roman Hummelt of Waltham.

### Precision

The data recorder has a precision tape drive for optimal performance, data transfer rate of 1200 baud, motor control from computer, automatic level control and automatic shut off.

All sockets for interface cables and power are on the back panel with the monitor plug on the front.

# Electron Tempest hits new high spot

A NEW level of sophistication in arcade action gaming for the Electron has been achieved by Superior Software with its version of the Atari classic Tempest.

The product is the result of a recent softening of Atari's former hardline policy toward software houses wishing to adapt its arcade games for micros.

As one industry observer recently wrote: "There are signs of much more sensible mutual cooperation between Atari and the hard pressed software publishers".

An early beneficiary

has been Superior Software, whose Electron version of Tempest carries the "Atari Approved" stamp on its packaging.

They have used all the latest techniques to make the game as similar to the original arcade version as possible – imitating closely the highly polished graphics and sound effects.

"Atari would only authorise this version of Tempest if it reached a high enough level of sophistication", Superior

managing director Richard Hanson told *Electron User*.

"They just aren't interested in seeing cheap and nasty copies of their games on the market."

"We have had to work very hard to produce a version that meets their standards."

"Now that we have achieved this level of performance I'm hoping that Tempest will be the first of many Atari arcade games available for the Electron".



Celebrity Chatline 585a  
MICRONET'S NEW WEEKLY INTERVIEW 0p

# Celebrity Chatline

The next LIVE interview via a national computer network will be held on MICRONET 800 next Wednesday 20th March starting at 7pm...

Derek Meakin, publisher of Teletink, and a host of magazines will answer questions LIVE from Micronetters

GOTO... #

# Micronet launches live Prestel show

MICRONET has launched a major innovation in interactive viewdata — the first live programme on Prestel to be scheduled on a regular weekly basis.

Celebrity Chatline gives micro owners their first chance ever to interview well known personalities direct from their home computers over the Micronet system.

The service is a development of the highly successful Late Night Chatline which is second only to Micronet itself in the Prestel Top

Ten of most popular areas accessed.

Celebrity Chatline is similar to Late Night Chatline's CB-style on-screen chat facility, except that Micronet editor David Babsky travels to the homes of selected celebrities.

As Micronet members electronically send questions on special message frames, the night's celebrity replies on-line straight away via his own home computer.

One of the first guests on Celebrity Chatline was Derek

Meakin, managing editor of *Electron User* who commented: "It was gratifying for Database Publications to be chosen to help launch this exciting new development in interactive viewdata."

"This is yet another example of the pioneering spirit behind the Micronet operation and helps to explain why micro users are joining in ever-increasing numbers."

Celebrity Chatline is on Micronet 800 every Wednesday between 7 and 8pm.

## Mini Office nominated for awards

MINI Office, the chart topping business package from Database Software for the Electron, has been nominated for The British Microcomputing Awards 1985 in two major categories.

It has been short-listed for both the Home Software class and Thames Television's Database Home Software of the Year award.

Elite, the cult adventure game from Acornsoft, is also on the short list — for the Home Computer Game of the Year.

Recognised as the Oscars of the computer industry, The British Micro Computing Awards this year attracted more than 1,000 entries.

### Excellence

Organised by Personal Computer World, The Sunday Times and Thames Television, the awards "seek to define technological excellence and value for money for the consumer".

Mini Office first hit the news headlines because of its revolutionary price — just £5.95 for a profes-



sionally written suite of four programs.

Consisting of a database, word processor, spreadsheet and graphics, it can turn any home computer into an inexpensive office tool.

"We are delighted to have been shortlisted," says Derek Meakin, head of Database.

"After all, a truly professional business software package at this price was a gamble — and fortunately it has paid off."

All the shortlisted products are to go before a panel of judges who will then select the top three finalists in each category and ultimately the outright winner.

## GAMES THAT HELP TELL THE TIME

A SOPHISTICATED learning program which helps children understand the relationship between the 12 hour analogue and the 24 hour digital clock has been released by Applied Systems Knowledge.

Time Trucker is a first time skill program incorporating graphics, music and rewards for achievement.

To ensure children can acquire the learning skills at their own speed, Time Trucker incorporates three ability levels with separate games called Trainee Trucker, Trucker and Super Trucker.

In each game the player is given a contract which must be assessed in order to collect the required fresh farm produce from the country and return to the depot within a specified time limit. Price is £9.95.

## Typewriter links to an Electron

OLIVETTI has brought out a portable electronic typewriter that doubles as a home computer printer or keyboard.

The ET compact 60 offers a range of typing and editing facilities for home or office use. These include an LCD line display, automatic correction of the work-

ing line with an 80 character memory buffer and a keyboard selector which allows for supplementary characters from foreign languages.

It will run on the Electron with the Plus 1 interface and the suggested selling price is around £375.

## Basic for beginners

A NEW six part series of books on Basic computer programs for the Electron written by Jonathan Inglis has been published by Granada.

Each Micro Mate is designed to be both educational and entertaining, to improve the micro user's skills and stimulate new ideas in the creative fields of music, graphics and animation as well as the areas of words and mathematics.

Titles in the series are Simple Shapes and Pictures, Simple Music and

Sound Effects, Simple Word Games, Simple Maths Table and Numbers, Simple Movement and Animation, and Simple Facts and Figures.

The books cost £1.95 each.

### FREE FIGHT

GAMES publisher Comsoft is offering Electron users a free copy of Custard Pie Fight with every two games purchased by mail order — a total of three games on separate cassettes for £10.



# Bespoke Patterns at Your Fingertips

SPOKES, by IAN ARCHER, is a program which draws a multicoloured pattern like the spokes of a wheel.

But it also does much more. When you run the program a wheel will appear on the screen.

You aren't stuck with just one pattern — you can use the keyboard to vary the way it's drawn.

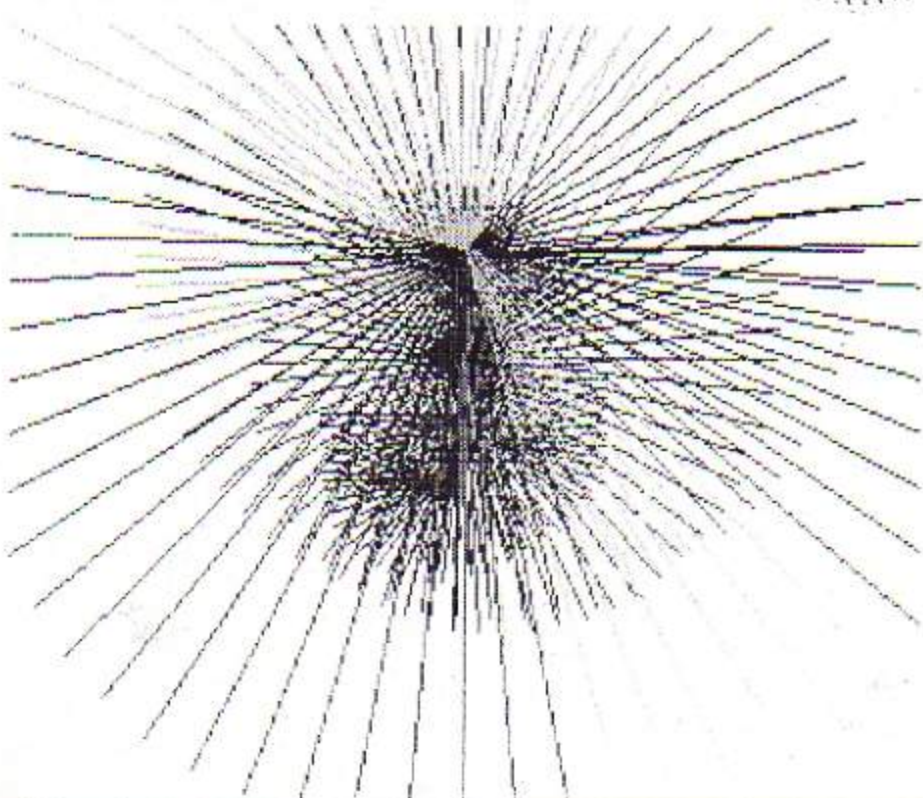
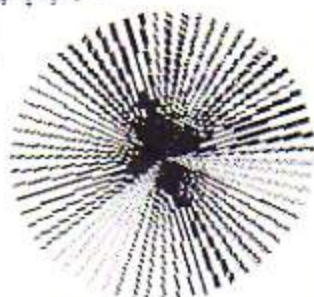
The spokes can be made longer or shorter and the centre of the circle can be moved around the screen. Fascinating and beautiful patterns can be drawn with ease.

Almost hypnotic, this short

program demonstrates the graphics abilities of the Electron to the full.

## KEYS:

- Z move centre left
- X move centre right
- : move centre up
- / move centre down
- ; increase spoke length
- . decrease spoke length



```

10 REM --- SPOKES ---
20 REM IAN ARCHER
30 REM (C) THE ELECTRON
  USER
40 MODE 1
  :VDU 23,1,0;0;0;0;
50 F=0
  :X=640
  :Y=512
  :RX=200
60 VDU 19,3,6;0;
70 PROCKEY
80 VDU 29,X;Y;
90 MOVE 0,0
  :DRAW RX+COS F,RX*
  SIN F
100 F=F+.1
110 IF RND(10)=16COL 0,
  RND(3)
120 GOTO 70
130 :
140 DEF PROCKEY
150 K=INKEY (0)
160 IF K=58Y=Y+4
170 IF K=47Y=Y-4
180 IF K=88X=X+4
190 IF K=90X=X-4
200 IF K=59R=R+4
210 IF K=46R=R-4
  :IF R<0R=0
220 IF K=32CLS
230 IF K=-1ENDPROC
240 GOTO 150
  
```

*This listing is included in this month's cassette tape offer. See order form on Page 61.*



IF you've been following the series so far (and what Electron beginner of taste and refinement won't be?) you'll be familiar with IF... THEN statements.

Also ANDs, ORs and EORs should hold no fears for you. IF you have any doubts about the above OR you're just feeling masochistic THEN reread the last three articles.

One thing that you may have noticed is that while we've been stringing conditions together with cunning ANDs and ORs there's only ever been one action after the THEN.

If the condition was true, then the program obeyed the instructions after the THEN. Otherwise the program ignores it.

We can build multiple conditions out of minor ones but there's only one action that depends on the outcome of the test. If there are two actions that might be taken we have to do two tests. Take a look at Program I which shows what I mean.

```
10 REM PROGRAM I
20 INPUT "Number " numbe
r
30 IF number>0 THEN PRIN
T "It's greater than 0"
40 IF number<0 THEN PRIN
T "It's less than 0"
```

Program I

Here we have two different messages. Whether they are displayed or not depends on the value of *number*. If *number* is greater than zero, the condition in line 30 is fulfilled and the subsequent message is printed.

If *number* is not greater than zero the test in line 30 fails and the following message isn't printed. The program then comes to the test in line 40.

Here, if *number* is less than 0 another message is printed. Notice that if *number* is 0 nothing happens.

The point to grasp is that we've had to do a separate test

for each separate message.

If we had another condition, say we wanted a message to tell us when *number* was greater than 100, we'd need another line.

In fact, in some cases we could end up with line after line of tests, each test followed by the appropriate action.

Looking back at Program I, you might feel intuitively that it could be shorter. After all, we've looked at *number* once in line 30. Couldn't we use this comparison to decide between both messages and so save having to have line 40?

The answer is that there is something else we can use and, in fact, it's ELSE. Program II uses it to produce a modified version of Program I.

```
10 REM PROGRAM II
20 INPUT "Number " numbe
r
30 IF number>0 THEN PRIN
T "It's greater than 0" ELSE
PRINT "It's not greater t
han 0"
```

Program II

Here you see the IF... THEN... ELSE structure being used. It's not hard to follow, its action reflects everyday English. Let's take a closer look at line 30.

The first part of the line is the familiar IF... THEN comparison. IF *number* is greater than 0 THEN the Electron tells you so.

What's new is the ELSE

that follows the first message.

Up until now we've had a condition tested by an IF and if the condition was true (or TRUE or -1) then the rest of the line was obeyed. If the test failed then the rest of that line was ignored.

However if there's an ELSE in the line then things are different.

Now if the condition is true the action after the condition (and before the ELSE) is taken. Everything after the ELSE is ignored.

On the other hand, when the condition is false (or FALSE or 0) then only the statements after the ELSE are obeyed.

In other words we have two courses of action following the IF. If the condition is true then the first course of action is followed. Otherwise (or ELSE) the second is the one selected.

In Program II this means that if *number* is greater than zero the micro tells you so (that is, the first course of action is taken). Otherwise the second course of action is taken and the Electron tells you that *number* is not greater than zero.

Notice that when we use IF... THEN... ELSE it's an either/or situation. The variable *number* is either greater than zero or it's not. Hence it all comes down to two courses of action.

Observant readers will have noticed that the action of Program II is slightly different than that of Program I.

Remember that nothing

happened in the first program when *number* was zero. Try that value in the second and see what occurs.

Let's leave ELSE for a short while and take a look at Program III.

```
10 REM PROGRAM III
20 PRINT "Sunday is 1, M
onday is 2 and so on until
Saturday is 7"
30 PRINT "Enter the day
number."
40 INPUT day
50 IF day=1 THEN PRINT "
It's weekend. You can have
a lie in."
60 IF day=7 THEN PRINT
"It's weekend. You can have
a lie in."
70 IF day=2 THEN PRINT "
It's a weekday."
80 IF day=3 THEN PRINT "
It's a weekday."
```

Program III

While it's not the world's most stunning example of programming it does have its interesting features. Notice how it uses numbers to stand for days of the week. Sunday is represented by 1, Monday by 2, and so on until Saturday is 7.

This method allows us to compare days of the week using our old familiar operators. After all, using this notation means that  $4 < 7$



## From Page 9

stands for Wednesday coming before Saturday.

You can do the same sort of thing with the months of the year. January can be represented by 1, February by 2 and so on. I'll let you guess which number signifies December.

Using this technique, lines 50 to 80 of Program III are easy to understand. Line 50 can be read as "If today is Sunday then say that it's weekend". Again, as 7 stands for Saturday we can see that line 60 prints the weekend message if day is 7.

However if day is neither 1 nor 7, it can't be weekend. Hence the messages in lines 70 and 80.

I've left out Wednesday, Thursday and Friday from the program. You can put them in if you want to, but it's a lot of typing.

There's a much easier way of doing things using our old friends, the logical operators. Program IV shows what I mean.

```
10 REM PROGRAM IV
20 PRINT "Sunday is 1, Monday is 2 and so on until Saturday is 7"
30 PRINT "Enter the day number."
40 INPUT day
50 IF day=1 OR day=7 THEN PRINT "It's weekend. You can have a lie in."
60 IF day<1 AND day>7 THEN PRINT "It's a weekday."
```

### Program IV

As you can see, this is a lot neater. One simple OR deals with the weekend (line 50) while an AND sorts out the weekdays.

Program III has been shortened, but we're not finished yet. After all, why have two comparisons? If it's not a weekday, then it must be weekend. It's either one or the other, a situation just made for an IF...THEN...ELSE. Have a look at Program V.

Much nicer isn't it? The IF of line 50 checks to see if the

multiple condition formed by the OR is true. If it is, then the weekend message is printed. If not the message following the ELSE is displayed.

```
10 REM PROGRAM V
20 PRINT "Sunday is 1, Monday is 2 and so on until Saturday is 7"
30 PRINT "Enter the day number."
40 INPUT day
50 IF day=1 OR day=7 THEN PRINT "It's weekend. You can have a lie in." ELSE PRINT "It's a weekday."
```

### Program V

This demonstrates the power of the IF...THEN...ELSE structure. It can be used to shorten and simplify programs and is very, very useful. The trouble is that like all powerful things, it has to be used properly. Handled badly things can go very wrong.

Examine Program V closely. Can you see anything that might cause it to go awry? Suppose you typed in 8 (probably meaning Sunday). What happens? You get the weekday message.

This wouldn't have happened with Program III, which would just have ignored the stupid input. As you can see, we've shortened the program but also limited it. The solution is shown in Program VI.

```
10 REM PROGRAM VI
20 PRINT "Sunday is 1, Monday is 2 and so on until Saturday is 7"
30 PRINT "Enter the day number."
40 INPUT day
50 IF day=1 OR day=7 THEN PRINT "It's weekend. You can have a lie in." ELSE IF day<1 AND day>7 THEN PRINT "It's a weekday."
```

### Program VI

This is the same as Program V except for the fact that there is now an IF after the ELSE of line 50. This means that the weekday message only gets

printed if day lies between 2 and 6. The erroneous input has been trapped.

You'll see from the above that it's not just PRINT statements and assignments that can follow IFs and ELSEs. We can have conditions as well, but beware. Too many conditions in an IF...THEN...ELSE can lead to chaos!

We can also have multiple statement lines. And what is a multiple statement? Well, there isn't one in Program VII.

```
10 REM PROGRAM VII
20 PRINT "THIS IS ";
30 PRINT "A SILLY ";
40 PRINT "PROGRAM."
```

### Program VII

The message displayed sums up the program. My only excuse for it is that it can be used to show multiple statements. Program VIII shows lines 20, 30, and 40 turned into one multiple statement line, line 20.

```
10 REM PROGRAM VIII
20 PRINT "THIS IS ";PRINT "A SILLY ";PRINT "PROGRAM."
```

### Program VIII

As you can see, a multiple line is just lots of lines strung together on one line, separated by colons.

They are processed faster than normal lines and take up less space but they do make a program less easy to understand. Avoid them if possible.

Program IX shows them in use, shortening Program I. Personally I prefer Program I as it was.

```
10 REM PROGRAM IX
20 INPUT "Number " number
30 IF number>0 THEN PRINT "It's greater than 0"
40 IF number<0 THEN PRINT "It's less than 0"
```

### Program IX

Let's use what we've learnt about IF...THEN...ELSEs and multiple statement lines to improve Program X.

```
10 REM PROGRAM X
20 less_than=0
30 equal_or_over=0
40 FOR loop=1 TO 10
50 READ number
60 IF number<10 THEN PRINT;number " is less than ten."
70 IF number<10 THEN less_than=less_than+1
80 IF number=10 THEN PRINT;number " is greater than or equal to ten."
90 IF number=10 THEN equal_or_over=equal_or_over+1
100 NEXT loop
110 PRINT "There are ";less_than " numbers less than ten."
120 PRINT "There are ";equal_or_over " numbers greater than or equal to ten."
130 DATA 1,6,3,23,4,56,7,8,45,10
```

### Program X

There's nothing new in this. You should be able to see that it looks at the numbers held in the DATA statement of line 130 and sees how they compare with 10. It also keeps a running total of the results.

```
10 REM PROGRAM XI
20 less_than=0
30 equal_or_over=0
40 FOR loop=1 TO 10
50 READ number
60 IF number<10 THEN PRINT;number " is less than ten."
70 IF number=10 THEN PRINT;number " is greater than or equal to ten."
80 NEXT loop
90 PRINT "There are ";less_than " numbers less than ten."
100 PRINT "There are ";equal_or_over " numbers greater than or equal to ten."
110 DATA 1,6,3,23,4,56,7,8,45,10
```

### Program XI

However close inspection shows that we're doing both



comparisons twice. Both lines 60 and 70 test for *number* being less than 10. One puts the message on the screen while the other adjusts the count. Similarly lines 80 and 90 check for the opposite case.

This seems a bit wasteful. It would obviously be better if each check was only done once. Program XI incorporates this idea.

Here there is only one comparison to see if *number* is less than 10. It's in line 60. If the condition is true then the rest of the line after the THEN not only prints the appropriate message, it also updates the running total.

Line 70 does exactly the same for the opposite case when *number* is greater than or equal to 10. Again two comparisons have been

replaced by one, using multiple statements after the THEN.

You'll see that I've used multiple statements in line 90 which replaces lines 110 and 120 of the previous program.

So Program XI is both shorter and more efficient than Program X, if a little less intelligible.

There's room for improvement yet, however. After all, if a number isn't less than 10, it must be either equal to or greater than 10.

Obviously the situation is ripe for skilful application of an IF... THEN... ELSE. Program XII is the result.

We've seen that we can have an IF after the ELSE. Now, in line 30, we've not only got an IF after the ELSE, we've also got another ELSE.

And that's about it for this month, except for Program XIII which is a variant of Program I.

```
10 REM PROGRAM XIII
20 INPUT "Number " numbe
r
30 IF number>0 THEN PRIN
T "It's greater than 0" ELS
E IF number<0 PRINT "It's
not greater than 0" ELSE PR
INT "It's zero."
```

Program XIII

As you can see, the program now deals with the case where *number* is equal to 0, a feature lacking in Program II.

I leave it to you to experiment with "stacking" the ELSEs in this way, but be warned. You can easily lose your program in a tangle of conditions.

As ever, the best advice is keep it simple and try it for yourself. It's the best way to learn.

```
10 REM PROGRAM XII
20 less_than=0
30 equal_or_over=0
40 FOR loop=1 TO 10
50 READ number
60 IF number<10 THEN PRI
NT;number " is less than te
n.":less_than=less_than+1 E
LSE PRINT;number " is great
er than or equal to ten.":e
qual_or_over=equal_or_over+
1
70 NEXT loop
80 PRINT "There are ";le
ss_than" numbers less than
ten.":PRINT "There are ";eq
ual_or_over" numbers greate
r than or equal to ten."
90 DATA 1,6,3,23,4,56,7,
8,45,10
```

Program XII

ELECTRON, BBC Model B  
(any OS, BASIC I/II)

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£9.95  
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.....  
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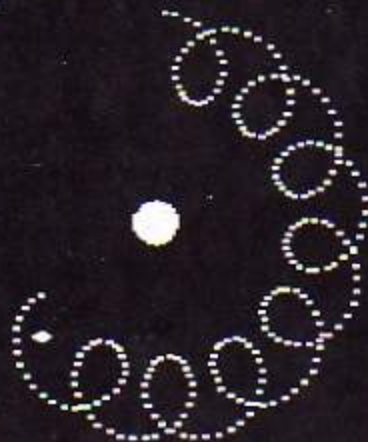
# Moon Orbit

ARE you interested in heavenly bodies? ROG FROST certainly seems to be.

To follow his Star Chart and Fortune Teller in the May issue of *Electron User* he's now sent us Moon Orbit. It's a simple but effective demonstration of the moon's orbit round the earth as the earth circles the sun.

The only thing wrong is that it doesn't tell us when there's going to be a full moon. This would be useful as peculiar things happen to the editor around that time.

Still, no doubt one of our readers will soon rectify the situation.



```

10 REM MOON ORBIT
20 REM By Rog Frost
30 REM (C) Electron User
40 REM
50 MODES
60 VDU5
70 VDU23,225,0,24,60,126
126,60,24,0
80 VDU23,226,0,0,0,24,24
0,0,0
90 earthx%=0:earthx%=400
100 earthrad%=400:moonrad
%=100
110 mooncol%=0
120 VDU29,640,512:
130 GCOL0,3:MOVEearthx%,e
arthx%:VDU225:MOVED,0
140 FORsun%=0TO360STEP20
150 sunx%=SINRAD(sun%)*50
:suny%=COSRAD(sun%)*50
160 GCOL0,2:MOVED,0:PLOT0
5,sunx%,suny%
170 NEXT
180 REPEAT
190 mooncol%=mooncol%+1
200 col%=1+mooncol% MOD 2
210 FORearthorbit%=0TO360
220 VDU29,640,512:
230 GCOL4,0:MOVEearthx%,e
arthx%:VDU225:GCOL4,3
240 earthx%=SINRAD(eartho
rbit%)*earthrad%
250 earthx%=COSRAD(eartho
rbit%)*earthrad%
260 MOVEearthx%,earthx%:V
DU225
270 VDU29,640+earthx%:512
+earthx%:
280 moonx%=SINRAD(earthor
bit%+14)*moonrad%
290 moonx%=COSRAD(earthor
bit%+14)*moonrad%
300 GCOL0,col%
310 MOVEmoonx%,moonx%:VDU
226
320 NEXT
330 UNTIL0
    
```

This listing is included in this month's cassette tape offer. See order form on Page 61.

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|----|-------------|---------|----------|--------|
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| 2  | MORTGAGE    | 85.72   | 85.72    | 85.72  |
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| 8  | EARNINGS    | 321.21  | 321.21   | 321.21 |
| 9  | S. PWD.     | 27.35   | 0.00     | 27.45  |
| 10 | TO SPEND    | 249.46  | 211.21   | 248.62 |
| 11 | SPENT       | 299.06  | 211.97   | 234.88 |
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| 14 | C.PWD.      | 0.00    | 27.41    | 28.46  |

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| RECORD NO. 2 | SURNAME: ANDREWS<br>FIRST NAME: PETER<br>ADDRESS1: 12 ELF ROAD<br>ADDRESS2: HEREFORD<br>TELEPHONE: 321-623451<br>AGE: 19   | RECORD NO. 2 | SURNAME: ANDREWS<br>FIRST NAME: PETER<br>ADDRESS1: 12 ELF ROAD<br>ADDRESS2: HEREFORD<br>TELEPHONE: 321-623451<br>AGE: 19 |
| RECORD NO. 3 | SURNAME: SMITH<br>FIRST NAME: JANE<br>ADDRESS1: 42 HIGH STREET<br>ADDRESS2: SALFORD<br>TELEPHONE: 822-61421<br>AGE: 27     | RECORD NO. 3 | SURNAME: BRINN<br>FIRST NAME: KATH<br>ADDRESS1: 15 MILL ROAD<br>ADDRESS2: WARRINGTON<br>TELEPHONE: 853-80923<br>AGE: 30  |
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| RECORD NO. 5 | SURNAME: ANDREWS<br>FIRST NAME: JAMES<br>ADDRESS1: 12 ELF ROAD<br>ADDRESS2: HEREFORD<br>TELEPHONE: 321-623451<br>AGE: 13   | RECORD NO. 5 | SURNAME: BROWN<br>FIRST NAME: JIM<br>ADDRESS1: 8 CLM ROAD<br>ADDRESS2: NANTWICH<br>TELEPHONE: 681-85011<br>AGE: 11       |

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| 1  | 85.72  | 91.37  | 91.37  | 91.37  | 91.37  | 91.37     | 85.74   | 85.74    | 85.74    | 1055.75 |
| 2  | 22.71  | 41.25  | 28.28  | 22.71  | 27.98  | 25.99     | 40.89   | 29.89    | 46.45    | 480.26  |
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| 6  | 378.91 | 355.51 | 191.15 | 355.51 | 180.69 | 219.21    | 292.90  | 228.80   | 289.51   | 2858.18 |
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| 10 | 276.91 | 232.38 | 191.15 | 201.78 | 180.69 | 219.21    | 295.90  | 228.80   | 289.51   | 2658.18 |
| 11 | 72.79  | 139.21 | 196.96 | 201.77 | 222.91 | 189.85    | 106.87  | 151.27   | 101.61   | 1278.58 |
| 12 | 24.59  | 104.40 | 147.72 | 150.88 | 167.18 | 142.57    | 80.15   | 119.42   | 76.21    | 958.84  |
| 13 | 18.20  | 34.80  | 49.24  | 50.29  | 55.75  | 47.46     | 26.72   | 37.81    | 125.40   | 219.65  |

## BBC MODEL 'B' and ELECTRON

### GRAPHICS

### WORD PROCESSOR

Page 1

This is a demonstration of the  
MINI OFFICE word processor  
showing the various printout  
options available.

Page 1

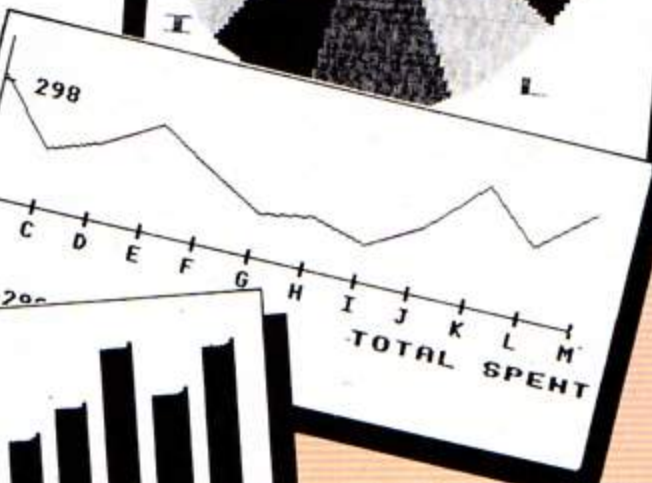
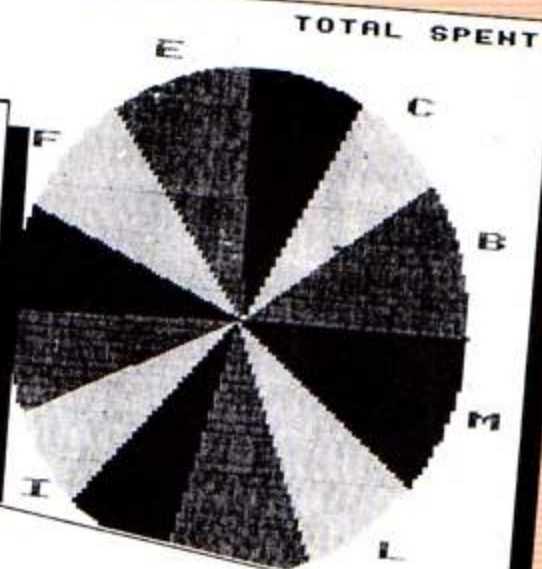
This is a demonstration of the MINI  
OFFICE word processor showing the  
various printout options available.

This is a demonstration of the MINI OFFICE word processor  
showing the various printout options available.

This is a demonstration of the MINI OFFICE word processor showing the  
various printout options available.

Page 1

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of the MINI OFFICE word processor showing the  
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# SCRAPBOOK

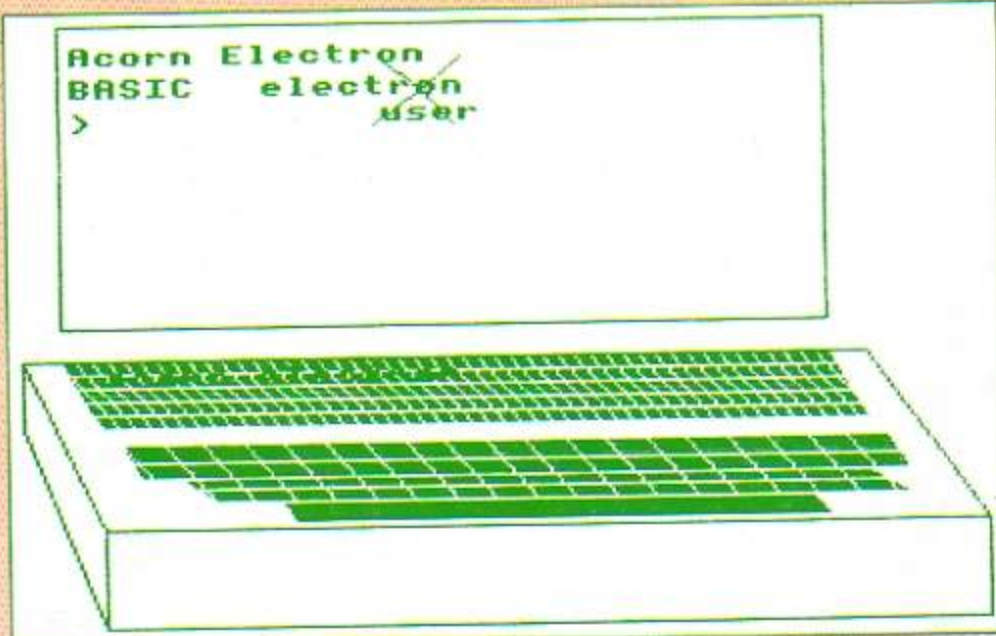
SCRAPBOOK is the feature that contains a selection of all the short, simple programs sent in by our readers.

It's where we keep a record – our scrapbook – of all the interesting little routines that don't end up in the Notebook or in Program Probe but are too good for us not to share.

This month it's very much a graphics show. Next month – who knows? It's up to you.

So if you enjoy messing about with your Electron and want to share your discoveries with other Electron users, send them in to us.

*Electrons  
within  
Electrons  
by  
Oliver Bishop*



```
10 REM ELECTRON
20 REM OLIVER BISHOP
30 REM LIVERPOOL
40 MODE 1:VDU 19,2,2,0,0
50 MOVE 100,0
60 DRAW 1200,0
70 MOVE 100,150
80 DRAW 1200,150
90 DRAW 1200,0
100 MOVE 100,0
110 DRAW 100,150
120 DRAW 0,400
130 DRAW 0,300
140 DRAW 100,0
150 MOVE 1200,150
160 DRAW 1050,400
170 DRAW 0,400
180 DRAW 0,400
190 MOVE 50,400
200 MOVE 1000,400
210 GCOL 0,2
```

```
220 PLOT85,100,300
230 PLOT85,1050,300
240 VDU 5
250 GCOL 0,3
260 FOR A=400 TO 300 STEP
-20
270 GCOL 0,0
280 MOVE 50,A
290 DRAW 1055,A
300 NEXT A
310 FOR A=100 TO 1060STEP
20
320 MOVE A,300
330 DRAW A-75,400
340 NEXT A
350 GCOL 0,3
360 MOVE 0,400
370 DRAW 1050,400
380 GCOL 0,3
390 MOVE 150,225
400 MOVE 1100,225
410 PLOT 85,125,275
```

```
420 PLOT 85,1075,275
430 MOVE100,250:GCOL 0,0:
DRAW 1100,250
440 MOVE 240,190:MOVE 110
0,190:GCOL 0,3:PLOT85,200,2
25:PLOT85,1050,225:GCOL 0,0
450 MOVE 340,160:MOVE 100
0,160:GCOL 0,3:PLOT85,300,2
25:PLOT85,950,225
460 MOVE100,210:GCOL 0,0:
DRAW 1100,210
470 FOR A=190 TO 1150 STE
P 50
480 MOVE A,190
490 DRAW A-75,290
500 NEXT A
510 MOVE 100,225:DRAW 110
0,225
520 MOVE 100,190:DRAW 110
0,190
530 GCOL 0,3:MOVE 100,390
```

```
:PRINT "acorn electron"
540 MOVE 50,450:DRAW 1000
,450:DRAW1000,900:DRAW50,90
0:DRAW 50,450
550 MOVE 60,870:PRINT "Ac
orn Electron"
560 MOVE 60,820:PRINT "BA
SIC"
570 MOVE 60,770:PRINT ">"
580 MOVE 500,800:DRAW 450
,850
590 MOVE 500,800:DRAW 440
,750
600 MOVE 500,800:DRAW 550
,850
610 MOVE 500,800:DRAW 540
,750
620 MOVE 300,820:GCOL0,1:
PRINT"electron"
630 MOVE 450,780:GCOL0,1:
PRINT"user"
640 GOTO 640
```



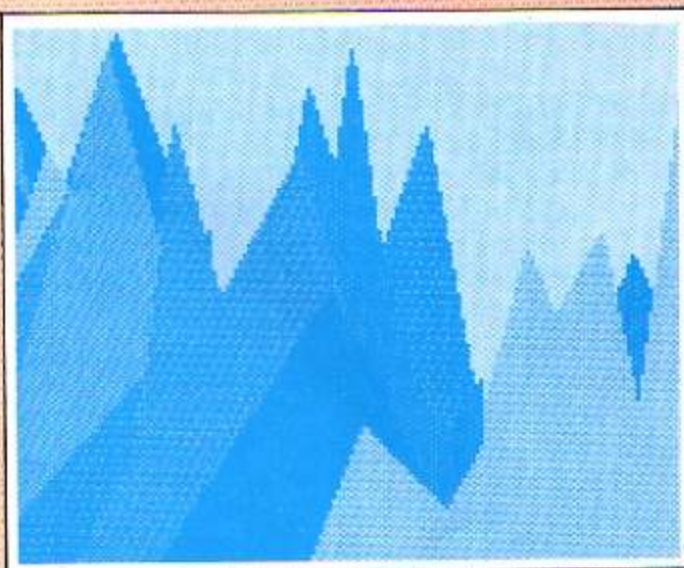
Send your programs to  
Scrapbook, *Electron*  
User, 68 Chester Road,  
Hazel Grove, Stockport  
SK7 5NY.

# The Cumbrian Hills - D.V. Hodgson

```

10 REM COLOURFUL MOUNTAIN RANGE
20 REM BY D.V. HODGSON
30 REM KESWICK, CUMBRIA
40 REM USE KEY 1 AND 2 TO SWITCH
50 REM COLOUR CHANGE ON AND OFF.
60 MODE 2
70 VDU 23,1,0;0;0;0;
80 MX=0
90 VDU 19,0,6,0,0,0
100 FOR CX=0 TO 1279 STEP RND(500)
110 GCOL 0,RND(7)
120 MOVE CX-RND(500),0:MOVE CX+RND(500),0:PLOT 85,CX
,RND(1024)
130 IF INKEY(-49) THEN MX=1
140 IF INKEY(-48) THEN MX=0
150 IF MX=1 THEN PROCcolchange
160 SOUND 1,-15,RND(255),1
170 NEXT CX
180 GOTO 100
190 DEFPROCcolchange
200 FOR loop=1 TO 7
210 VDU 19,loop,RND(7),0,0,0
220 NEXT loop
230 ENDPROC

```

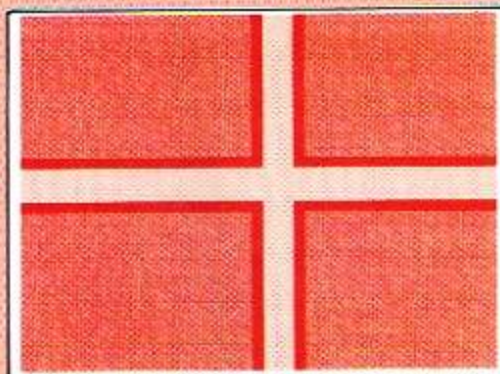


```

10 REM FLAGS
20 REM DAVID HOLYNEUX
30 REM CHELMSFORD
40 MODE2
50 VDU 23,1,0;0;0;0;
60 GCOL 0,RND(7)
70 MOVE550,100:MOVE550,400:PLOT85,100,100
80 MOVE100,400:MOVE100,100:PLOT85,550,400
90 MOVE550,500:MOVE550,800:PLOT85,100,500
100 MOVE100,500:MOVE100,800:PLOT85,550,800
110 MOVE1200,500:MOVE1200,800:PLOT85,650,500
120 MOVE650,500:MOVE650,800:PLOT85,1200,800
130 MOVE1200,400:MOVE1200,100:PLOT85,650,100
140 MOVE650,400:MOVE650,100:PLOT85,1200,400

```

by David Holyneux



```

150 GCOL 0,RND(7)
160 MOVE1200,500:MOVE1200,400:PLOT85,100,400
170 MOVE100,500:MOVE100,400:PLOT85,1200,500
180 MOVE650,100:MOVE550,100:PLOT85,650,800
190 MOVE550,800:MOVE650,800:PLOT85,550,100
200 GCOL 0,RND(7)
210 MOVE100,420:MOVE100,400:PLOT85,1200,400
220 MOVE570,100:MOVE630,100:PLOT85,630,800
230 MOVE1200,420:MOVE1200,400:PLOT85,100,420
240 MOVE630,800:MOVE570,800:PLOT85,570,100
250 FOR=1 TO 500: NEXT
260 GOTO 40

```

Pixelated stuff



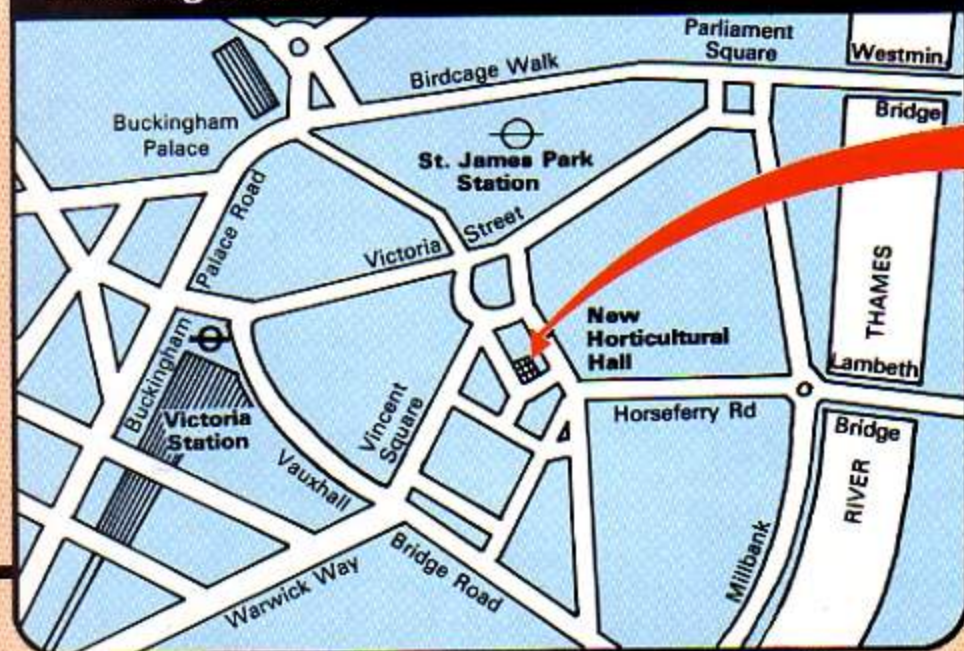


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EU4



CHARLES FRANCIS takes you back to the days of yore with this fascinating heraldic pattern maker

# Blazon

BLAZON is a charming, gentle graphics program that produces a series of beautiful and strangely peaceful patterns.

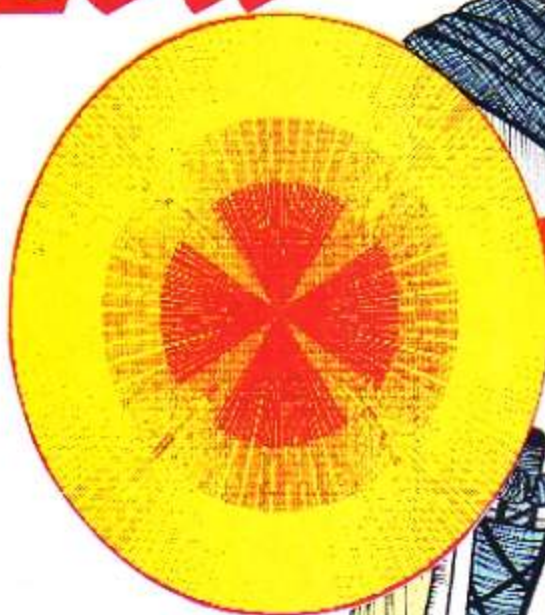
It works by drawing four concentric discs made up of concentric spokes.

In each consecutive disc the radius is reduced and the angle between the spokes is increased, thus creating striking screen patterns.

The Electron's palette is then randomised, producing a series of different "heraldic shields" on the screen - hence its name.

Both the mode and the angle between the spokes are also random, so a wide range of patterns is displayed.

The program can be stopped at any stage using Space and restarted using the S key.



## *This is the program structure:*

- 40 Randomises mode selection (1 or 5).
- 50 Gets rid of cursor.
- 70-160 Randomises the palette, subject to the condition that the first colour is not the same as the background or the second colour.
- 180,190 Selects the angle between the spokes.
- 200 The origin is set to the centre of the screen.
- 210-310 Draws the concentric sets of spokes.
- 300,350 Ensures the program stops if the space bar is pressed and starts when the S key is pressed.
- 330-390 Flashes the different colour shields.

|                            |                           |                                |                           |
|----------------------------|---------------------------|--------------------------------|---------------------------|
| 10 REM BLAZON              | 130 VDU19,IX,AX(IX),0,0,0 | 250 X=RX*SINT:Y=RX*COST        | TILINKEY(-B2)             |
| 20 REM BY CHARLES FRANCIS  | 140 NEXT                  | 260 MOVE-X,-Y: DRAWX,Y         | 360 UNTILTIME>TI+200      |
| 30 REM (C) ELECTRON USER   | 150 COLOUR(128+RND(3))    | 270 MOVE-X,Y: DRAWX,-Y         | 370 FORIX=0TO3            |
| 40 MODE(4+RND(2)-3)        | 160 CLS                   | 280 MOVEY,-X: DRAW-Y,X         | 380 AX(IX)=RND(7)         |
| 50 VDU23,1,0;0;0;0;        | 170 RX=750                | 290 MOVEY,X: DRAW-Y,-X         | 390 VDU19,IX,AX(IX),0,0,0 |
| 60 DIMAX(3)                | 180 BX=4+RND(16)          | 300 IFINKEY(-99) THEN REPEATUN | 400 NEXT                  |
| 70 AX(0)=RND(7)            | 190 H=PI/BX/16            | TILINKEY(-B2)                  | 410 NEXT                  |
| 80 FORIX=1TO3              | 200 VDU29,641;513;        | 310 NEXT: NEXT                 | 420 RUN                   |
| 90 AX(IX)=RND(7)           | 210 FORIX=0TO3            | 320 FORJX=1TO12                |                           |
| 100 IFAX(IX)=AX(0) THEN 90 | 220 GCOL0,IX              | 330 TI=TIME                    |                           |
| 110 NEXT                   | 230 H=2+H:RX=RX*2/3       | 340 REPEAT                     |                           |
| 120 FORIX=0TO3             | 240 FORT=0TOPI/4STEPH     | 350 IFINKEY(-99) THEN REPEATUN |                           |

*This listing is included in this month's cassette tape offer. See order form on Page 61.*



# A handy text utility by JOHN WOOLLARD

**PROCtext enables you to write text anywhere upon the screen with an automatic wrap around of words so that none are split.**

It is designed to print out any length of text.

Before this procedure could be programmed it was most important to clearly set out what was required.

The final program could only be satisfactory if the initial conditions were accurately noted and then acted upon.

For instance, decisions needed to be taken about:

- The line length.
- The top and bottom line of the display.
- The width of the left hand margin.
- The spacing between the lines of the display.
- If a word was too long to fit onto a complete line then the first part of it would be printed and the rest put onto the next line.
- If the text was too long to place on one screen then a prompt would appear and

pressing Shift would reveal the rest of the text.

All of those requirements are reflected in the parameters of the procedure, which starts at line 120 in Listing 1:

```
120 DEFPROCtext(lm%,ll%,t
    lz,bl%,sp%,text$)
```

The variable *lm%* is the size of the left hand margin. *ll%* specifies the length of each line.

It is important that when the procedure is used in your programs that the total of *lm%* and *ll%* does not exceed the width of the screen.

In Mode 0 and Mode 3 that is 80, but in Mode 2 and Mode 5 it is only 20 characters across.

The *tl%* and *bl%* values specify the vertical position of the top and bottom lines of the display.

It is important that the bottom line value does not exceed the size of the screen — 25 in Modes 6 and 3 but 32 in the other modes.

*sp%* indicates the line spacing. It is usually set at 1 or 2, but can take a much higher value.

The text to be printed can be up to 254 characters long. A space is added to the end of the text to act as a terminator to the process.

If a text of greater length is needed to be printed then two calls of the procedure can be made. For example:

```
1000 PROCtext (2,17,3,22,2
    ,A$)
1010 CLS
1020 PROCtext (2,17,3,22,2
    ,B$)
```

where A\$ and B\$ are two long strings of text.

Once the required conditions have been decided on, an algorithm is drawn up, usually represented as a flow diagram.

The structure of that flow diagram indicates the course that the program in Basic should take. Figure 1 shows the

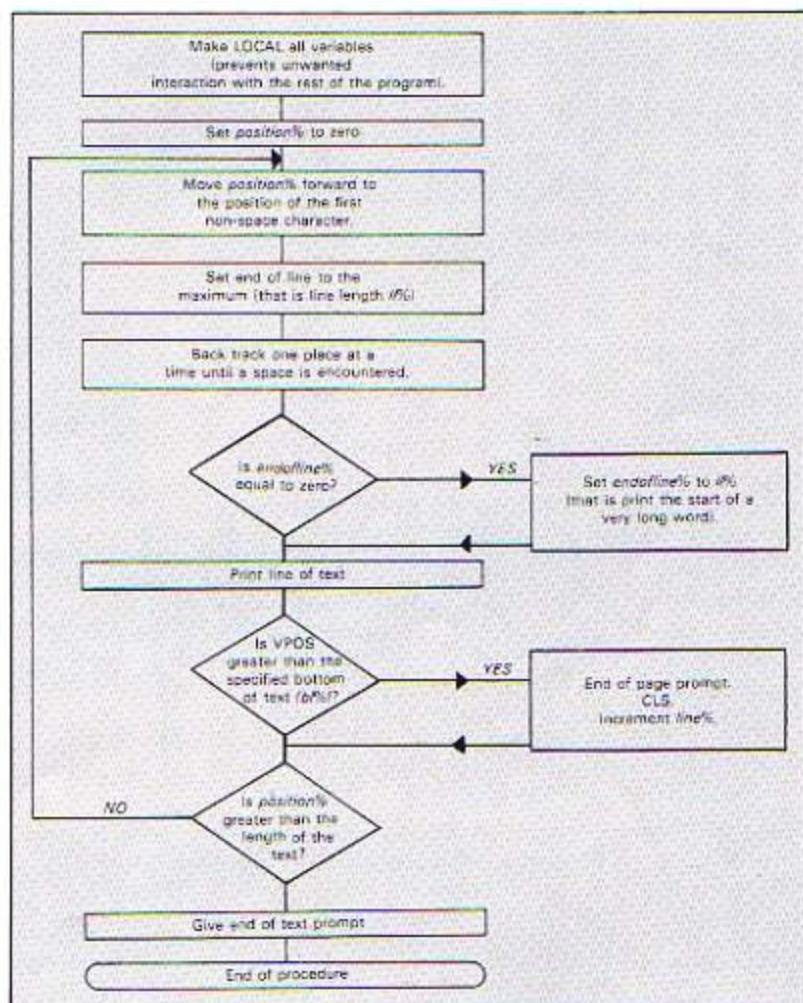


Figure 1: A flow chart of the procedure



## From Page 21

flow chart for the procedure.

Here is a step by step explanation of the coding of Listing I:

The first line of the procedure sets the three variables — *endofline%*, *position%* and *line%* — to be local. That means that if those variables are used elsewhere in your programs they will not affect each other.

A space is added to the end of the text string so that the process will terminate properly.

Line 170 moves the marker *position%* along the text string until it reaches the next (first) word. This is important because it eliminates spaces from the start of each line of text.

Line 180 is responsible for determining the length of each line of text. It starts searching backwards from the point equivalent to *position%+endofline%*. That is, from the maximum length a line of text can be.

It stops backtracking when it reaches the first space.

```
AS= "The text starts with a space and ends here!"
      ^           ^
      position%   position%+endofline%
      line length 11% = 19
```

Figure II: Initial markers

In Figure II the computer would have to backtrack four places to find the first space. The first line of text printed would be "The text starts" and the second would start with "with...".

On the second run of the loop *position%* would be at the

```
AS= "The text starts with a space and ends here!"
      ^           ^
      position%   position%+endofline%
```

Figure III: New position of markers

start of "with" and the computer would have to backspace three spaces this time. Figure III shows this.

```
AS= "The text starts with a space and ends here!"
      ^           ^
      position%   position%+endofline%
```

Figure IV: Final position of markers

The second line of text would be "with a space and" and the final line of text would be "ends here!"

Entering the text "The text starts with a space and ends here!" using PROCtext (2, 19, 2, 20, 1, AS) would produce:

The text starts  
with a space and  
ends here !

If the computer does not find a space when backtracking — which means there must be a word longer than the length of a line — then the value of *endofline%* = 0.

Line 190 tests for that state and, if so, as much of the word is printed as possible. The rest of the word goes onto the next line. Note that no hyphens are printed.

The line of text is then printed at the correct position on the screen.

The horizontal TAB is simply the value of the left margin *lm%*.

The vertical position is calculated as from the position of the top line plus the product of the line spacing and the

number of lines printed. Vertical tab =  $tf\% + sp\% \times line\%$ .

One condition set at the beginning was that if the text was too long for the screen a prompt would appear and the computer would wait for the Shift key to be pressed. Line 220 takes care of that.

VPOS is tested — that is the vertical position of the text cursor on the screen.

If it is greater than the specified value of the bottom line *bl%* then the prompt is given. The word SHIFT is printed at the bottom right hand side of the text.

The computer waits for the Shift key to be pressed, that is when INKEY (=1) is set. If you are using a BBC Micro you will notice that the Caps Lock and Shift Lock lights are both set.

This is caused by the silent sound command SOUND 1, 0, 0, 10. This emulates the page mode obtained by pressing Control N.

On the Electron you will notice that the Caps Lock LED becomes brighter.

Listing I contains the full procedure for printing out text. Listing II, in addition, prints up

```
10 REM PROCtext "listi
ng 1
20 REM
30 REM (C) Electron Use
r
40 REM
50 REM W.J.Woollard
60 REM
70 REM
80 MODE1
90 READAS
100 PROCtext(2,17,4,22,2,
AS)
110 END
120 DEFPROCtext(lm%,ll%,t
l%,bl%,sp%,text%)
130 LOCALendofline%,posit
ion%,line%
140 text%=text+" "
150 line%=0:position%=0
160 REPEAT:endofline%=11%
170 REPEAT:position%=posit
ion%+1:UNTILASC(MID$(text$,
position%))<>32
180 REPEAT:endofline%=end
ofline%-1:UNTILASC(MID$(tex
t$,endofline%+position%))=3
20REndofline%=0
190 IFendofline%=0THENend
ofline%=11%
200 PRINTTAB(lm%,tl%+sp%*
line%);MID$(text$,position%
,endofline%+1)
210 position%=position%+e
ndofline%:line%=line%+1
220 IFVPOS>=bl%THENPRINTT
AB(lm%+11%-6,VPOS+1)"SHIFT"
;:REPEATSOUND1,0,0,1:UNTILI
NKEY(-1):CLS:line%=0
230 UNTILposition%>=LEN(t
ext%)
240 PRINTTAB(lm%+11%-6,VP
OS+1)"SHIFT";:REPEATSOUND1,
0,0,1:UNTILINKEY(-1)
250 ENDPROC
260 DATA"The procedure PR
OCtext() is designed to ena
ble any passage to be print
ed out on the screen withou
t a word being split across
two lines. The parameters
necessary are: left margin,
line length, topline, bott
om line and spacing."
```

Listing I

The procedure  
PROCtext() is  
designed to ena  
ble any passage  
to be printed  
out on the screen  
without a word  
being split  
across two

lines. The  
parameters  
necessary are:  
left margin,  
line length,  
topline, bottom  
line and  
spacing.

SHIFT

The  
procedure  
PROCtext() is  
designed to ena  
ble any passage  
to be printed  
out on the screen  
without a word  
being split  
across two

are: left  
margin,  
line  
length,  
topline,  
bottom line  
and spacing.

SHIFT

SHIFT



the text in a randomly selected format which shows the versatility of this procedure.

It also contains a procedure for producing double height characters. (This procedure was fully explained in the July 1984 edition of *Electron User* - Walk Tall.)

Now here are some problems for you to consider. We'll be pleased to hear from you if you know the answers:

- A single line to enable the procedure to automatically hyphenate long words.
- A method of allowing indentation of text (my procedure strips off all leading spaces).
- A compact data validation routine to test that the line length will not go off the right hand side of the screen, that the bottom line is not off the bottom of the screen and that the text string is not too long.

I'm sure that will keep you busy. Happy programming!

```

10 REM PROCtext listi
ng 2
20 REM
30 REM (C) Electron Use
r
40 REM
50 REM W.J.Woodland
60 REM
70 REM
80 MODE1
90 VDU23,1;0;0;0;0
100 PROCdblh
110 READA$
120 PROCtext(RND(15),RND(
15)+10,RND(10),RND(10)+10,R
ND(5)+1,A$)
130 RUN
140 DEFPROCdblh:DIHdblh&F
F
150 FOROpt=0TO2STEP2:PX=d
blh:(OPT Opt:dbl STA&70:S
TX&79:STY&7A:LDA#10:LDB#&7B
:LDY#0:JSR&FFF1
160 LDA#23:JSR&FFEE:LDA#2
55:JSR&FFEE:LDA#71:JSR&FFEE
:LDA#71:JSR&FFEE:LDA#72:JSR
&FFEE:LDA#72:JSR&FFEE:LDA#7
3:JSR&FFEE:LDA#73:JSR&FFEE
LDA#74:JSR&FFEE:LDA#74:JSR&
FFEE:LDA#31:JSR&FFEE:LDA#79
:JSR&FFEE:LDA#7A:JSR&FFEE:L
DA#255:JSR&FFEE:LDA#255
170 LDA#23:JSR&FFEE:LDA#2
55:JSR&FFEE:LDA#75:JSR&FFEE
:LDA#75:JSR&FFEE:LDA#76:JSR
&FFEE:LDA#76:JSR&FFEE:LDA#7
7:JSR&FFEE:LDA#77:JSR&FFEE:
LDA#78:JSR&FFEE:LDA#78:JSR&
FFEE:LDA#31:JSR&FFEE:LDA#79
:JSR&FFEE:LDA#7A:ADC#1:JSR&
FFEE:LDA#255:JSR&FFEE
180 RTS:J:NEXT:ENDPROC
190 DEFPROCtext(lm%,ll%,t
lx,bl%,sp%,text$)
200 LOCALendofline%,posit
ion%,line%
210 text$=text$+" "
220 line%=0:position%=0
230 REPEAT:endofline%=1%
240 REPEAT:position%=posit
ion%+1:UNTILASC(MID$(text$,
position%))<>32
250 REPEAT:endofline%=end
ofline%+1:UNTILASC(MID$(tex
t$,endofline%+position%))=3
20REndofline%=0
260 IFendofline%=0THENend
ofline%=1%
270 FORcounter%=0TOendofl
ine%:AL=ASC(MID$(text$,cou
nter%+position%)):XY=lm%+cou
nter%:YX=tl%+sp%+line%:CALL
dblh:NEXT
280 position%=position%+e
ndofline%:line%=line%+1
290 IFVPOS=>bl%THENPRINTT
AB(lm%+1%-6,VPOS+1)*"SHIFT"
:REPEATSOUND1,0,0,1:UNTILI
NKEY(-1):CLS:line%=0
300 UNTILposition%>=LEN(t
ext$)
310 PRINTTAB(lm%+1%-6,VP
OS+1)*"SHIFT":REPEATSOUND1,
0,0,1:UNTILINKEY(-1)
320 ENDPROC
330 DATA"The procedure PR
OCtext() is designed to ena
ble any passage to be print
ed out on the screen withou
t a word being split across
two lines. The parameters
necessary are: left margin,
line length, topline, bott
om line and spacing."

```

Listing 11

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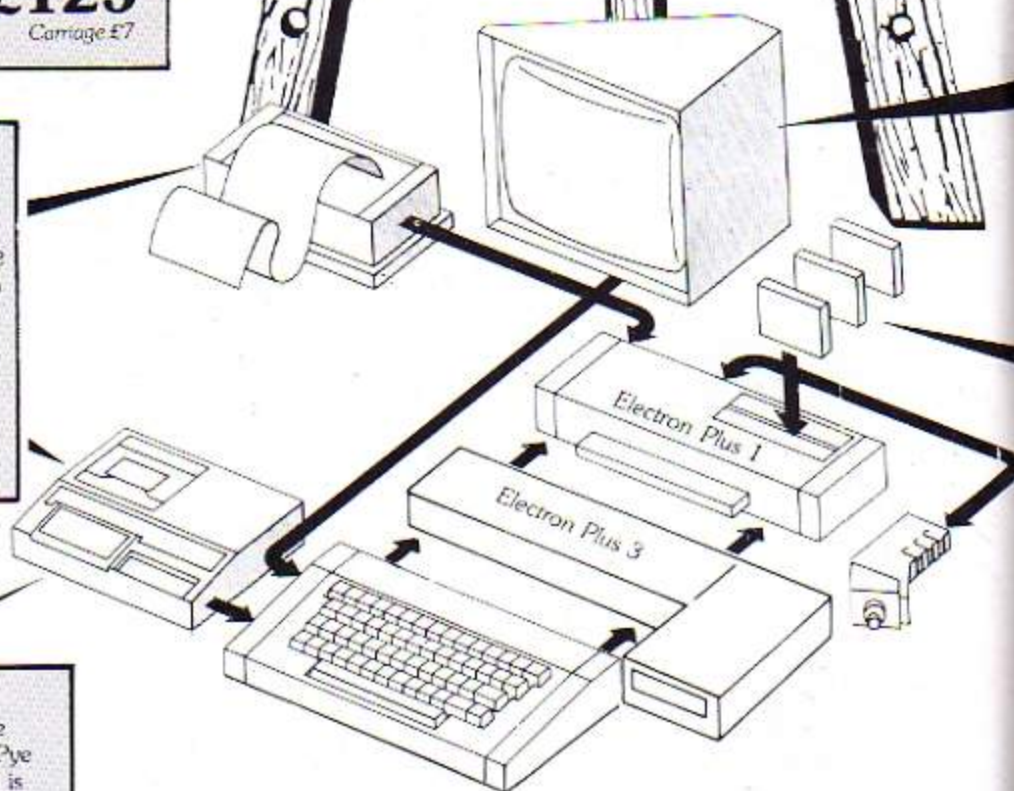
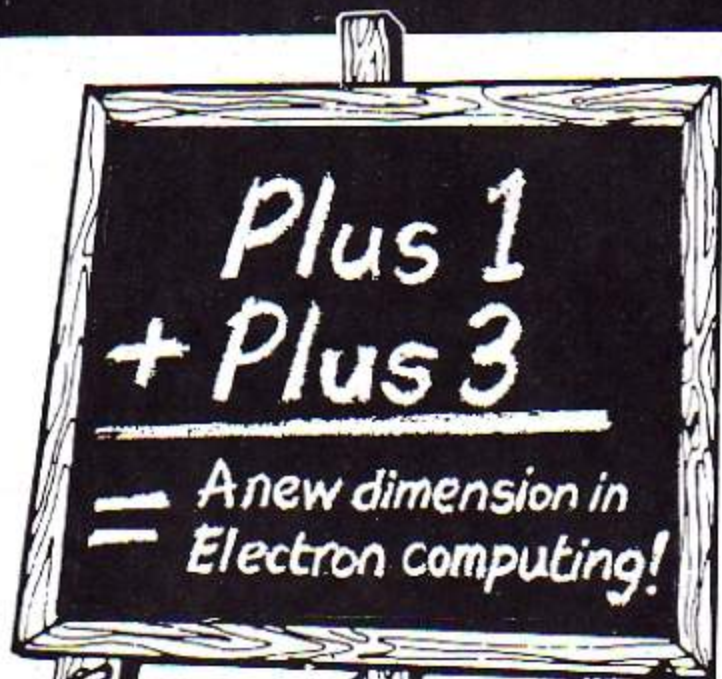
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## ***Dealers not listening to parents' pleas..***

**RICHARD Bonas** is usually a mild-mannered individual as befits a civil servant married with two children and living in a sleepy Berkshire village.

However if you wish to see his hackles rise and hear him resort to language fashionable for a Millwall fan, then just mention the Electron.

Yet it is not the machine itself which causes the Jekyll and Hyde-style personality change. It is only the fact that he bought one to help his youngsters (Helen, 13, and John 12) with their schooling – and now he can't find any suitable educational software.

"I think it's been a \*\*\*\*\* waste of money", he told *Electron User*. "We've been all over the place and all we can find is \*\*\*\* silly games."

"The situation is very frustrating. It's like buying a car and then discovering there is no petrol for it".

Richard Bonas is not alone in his criticism.

Down in Maidstone, Kent, Michael and Margaret Harkup were not overly enthusiastic about the education their seven year old daughter Kathryn was receiving – "enormous classes and sliding standards" – so they decided to do something practical to help.

They bought her an Electron.

"It's a big, bad world out there and we thought that this

# **Where has all the (educational) software gone?**

## **Asks MIKE COWLEY**

might give Kathryn an edge when she left school", recalls Margaret. "But as it has turned out, it seems we couldn't have been more naive".

Up in Huddersfield Yorkshire, there is a painfully similar story to be told by Patricia and Peter Hood.

On the day the price cut was announced for the Electron, they rushed out and bought one for the benefit of their three children, whose ages range from 11 to 13.

"We made a deal with the kids at that time in that they would buy any games and we would purchase the edu-

cational software", says Patricia Hood.

"The result is that so far it has cost us very little money – but we are not at all pleased about this".

All these are not isolated cases. In fact reports of lack of educational software for the Electron have been flooding in from all parts of the country.

But – hopefully – this situation may not exist for much longer.

For since the case of the missing educational software was highlighted in the March issue of *Electron User*, an intensive campaign has been

launched to correct the problem.

Leading this is Keith Spence, managing director of Kosmos, the software house that specialises in educational programs.

"There is no lack of educational software", he insists. "In all, there are probably in excess of 200 titles currently available for the Electron."

"But the problem lies with the distributors and retailers who would rather handle games because they sell in greater volume and so bring in greater profits".

"Now, with the backing of *Electron User*, we intend to change their minds about giving shelf space to educational software".

In order to do this, Keith Spence and his Kosmos team are currently lobbying distributors and major retailers throughout the UK.

And he is being supported in this by all the leading educational software houses.

Genevieve Ludinski of LCL told *Electron User*:

"We are trying to get the message over that retailers are being very short sighted by not stocking a full range of educational software."

"It's true that the games are much faster sellers, but they also are more of a fad, so dealers can be left with them



*Learning at home: children often need something more stimulating than games*





*Learning at school: more and more Electrons are finding their way into the classroom*

on their hands. Whereas good educational software always sells".

Over at Mirrorsoft, Jim Mackonchie has also been applying pressure to "the villains of the piece" — the distributors and retailers.

"We are trying to convince them — with some effect — that it is in their long term interest to gain a reputation for carrying a complete range of software, not just the chart topping games", he said.

The campaign has been leant even greater weight by the support of Acorn itself.

John Caswell, head of marketing for the company's consumer division, has already pledged his total backing.

The Acorn executive revealed he has written to many of the major retailers drawing their attention to the article in *Electron User*.

"And they are all becoming increasingly sensitive and understanding of this situation which I am endeavouring to rectify", he says.

"The problem is really an

economic one. After all it's just good commercial sense for the retailers to allocate their shelf space to what sells best. And, for the moment anyway, that is games.

"But our task now is to create the demand for the product at street level to such an extent that the retailers will have no choice but to stock educational software".

However it looks as though it may well be an uphill struggle — at least for the time being.

Ben Godbolt of Warwick Distribution — suppliers to Woolworths, Comet and Granada — explains why:

"The trouble is as soon as you attach the 'educational' label to a product, you may as well confine it to the waste paper basket.

"All the major multiples, which now account for most of the high street sales, need high volume lines. And these are essentially games orientated.

"What the software houses should be thinking of is in terms of 'games which

instruct' and not purely educational material.

"The only other option open to them is to make the educational software more financially attractive, with possibly higher discounts or consignment prior to sale.

"After all, educational software has been around for some time and quite a lot of multiples have already burned their fingers on it".

Nor has the case being put forward by the software houses convinced at least one high street giant.

David Gilbert, marketing manager of Dixons, clearly gave the thumbs down to the idea of stocking educational software.

"We don't see it as a market", he told *Electron User*. "As far as we are concerned, there is not enough money in it to make it commercially viable".

However Keith Spence of Kosmos and his colleagues in the industry are not prepared to accept "no" as the answer. "We will campaign until the

picture has changed for all those concerned parents like Richard Bonas who have bought Electrons to help their kids.

"The situation will change. It has to change".

But as the controversy over the lack of educational software for the Electron rages on, some people at least are left with broad smiles on their faces — the mail order software houses.

For while the distributors and retailers fight shy of educational software, they are only too pleased to fill the demand gap.

One company, 21st Software, has been launched recently simply because of the non-availability problem. And managing director John Snowden is the first to admit that response has been "overwhelming".

He told *Electron User*: "We are in the very fortunate situation to have a thriving business which is providing a true public service at the same time".



AS you are no doubt aware, the unexpanded Electron can't use joysticks – it has to have a joystick interface added to it.

So if you want to play games with a joystick you have to pick a joystick interface. And to pick wisely, you have to know exactly what you're after.

This is because joysticks work in two ways. There are analogue joysticks – they are the kind that the Plus 1 supports. And there are switched, or Atari-style, joysticks – the kind every other interface supports. Whichever interface you choose will use one of these methods.

This leads to the problem that games written for one type of joystick won't work with the other type. So you may end up with an analogue joystick that won't operate games written with the switched joystick in mind and vice versa.

Until now the remedy has been to use software patches – programs that are loaded before the game which attempt to bridge the gap

between the two types of joystick operation. Joyplus in the April issue of *Electron User* is an example of this.

The trouble is that no matter how good the software patch is, some games still won't work. Also, if you're like me, you'll often load the game, then remember that you should have loaded the patch first.

One answer to this problem has come with Power Software's Electron joystick interface.

This is a small, neat interface box that fits snugly onto the back of the Electron. It takes the standard 9-pin D-type connector switched joystick and allows the Elec-

tron to play switched joystick games.

However it does much more than that. Inside is a ROM chip that contains a software patch allowing the Power interface to work with games written for analogue joysticks. These are primarily Acornsoft games.

This software is available instantly at the call of a \*JOY, which is far quicker than loading cassette based patches.

It's easy to fit and simple to use. The instruction sheet, which comes on the back of the 12 months warranty card, is thorough and easy to understand.

Once fitted, the \*JOY com-

mand invokes the ROM software. This then takes you through a menu of choices which allow you to specify which joystick movements are to take the place of which keys. Then when you are sure everything is right you load your program as normal.

It's an excellent piece of hardware that I thoroughly recommend. While I can't guarantee that it works on all games – I haven't got them all! – it has certainly worked on all the ones I've tried.

This alone would be enough to recommend it. But the ROM based software along with the simple but thorough instructions make it a winner.

**Cliff Sumner**

# Joystick games made easy...

## ... with this high speed ROM software/joystick interface

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This one has everything! Create your own file of up to 20 fields, decide the length of the fields then name them. Insert the data by just typing in. Search either the start of a field or anywhere in a field!

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A very useful accounts program, showing amount, date, reference, item and current balance after each entry.

Allows up to nearly 500 transactions of either debit or credit, with editing of any entry and automatic balance at all times. The 32 categories can be customised, and there is a facility for estimating. Files can of course be saved to tape.

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A traditional Adventure with all the ingredients of the originals, giving endless hours of enjoyment, with no little hair-tearing in the attempt to solve it. In this Adventure the aim of course is to find and kill Count Dracula before he gets you.

#### RING OF TIME

Another traditional Adventure, but somewhat harder than Dracula, with some fiendish problems in your quest to find the ring. Plenty of locations and action make this one of the all-time greats.

Both these Adventures are completely logical, which means that all the locations remain the same and articles which are dropped are still there when you return. They also have the unique Kansas split screen display, which means the important information always remains on view, whilst other information scrolls up below. Both of course have the important game saving facility. And if you are completely stuck, there's our telephone 'Help!' service!

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All main commands toggle on the function keys, which are: Add; Edit; Search; Replace; Save text; Load text; Inform; Exit processor; Enter processor; Clear text; First page; Next page; Previous page; Last page; Insert text; Delete text; Insert Buffer; Clear Buffer; Format.

It will do many other things and will output to a printer through a Plus One interface, either continuous or separate sheets, emphasised or draft copy, double or single spacing, adjustable page length and optional page numbering.

Editing and inserting text is simplicity itself and a buffer allows up to 255 characters to be either moved around the file or duplicated elsewhere. It does everything a good word processor should do and comes complete with extensive Instruction Manual which contains a unique User Guide.

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absolute novice not only the formal rules of Basic but also that elusive quality - good programming style.

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A close-up photograph of a hand with light-colored fingernails typing on a vintage BBC Micro keyboard. The keyboard is grey with white keys and a row of red function keys on the right. The background is a gradient of blue and white. The author's name 'Mike Bibby' is in the top right, and the title 'Getting started in BBC Basic on the BBC Micro & Electron' is in a blue banner across the middle. The publisher's name 'DATABASE PUBLICATIONS' is at the bottom.

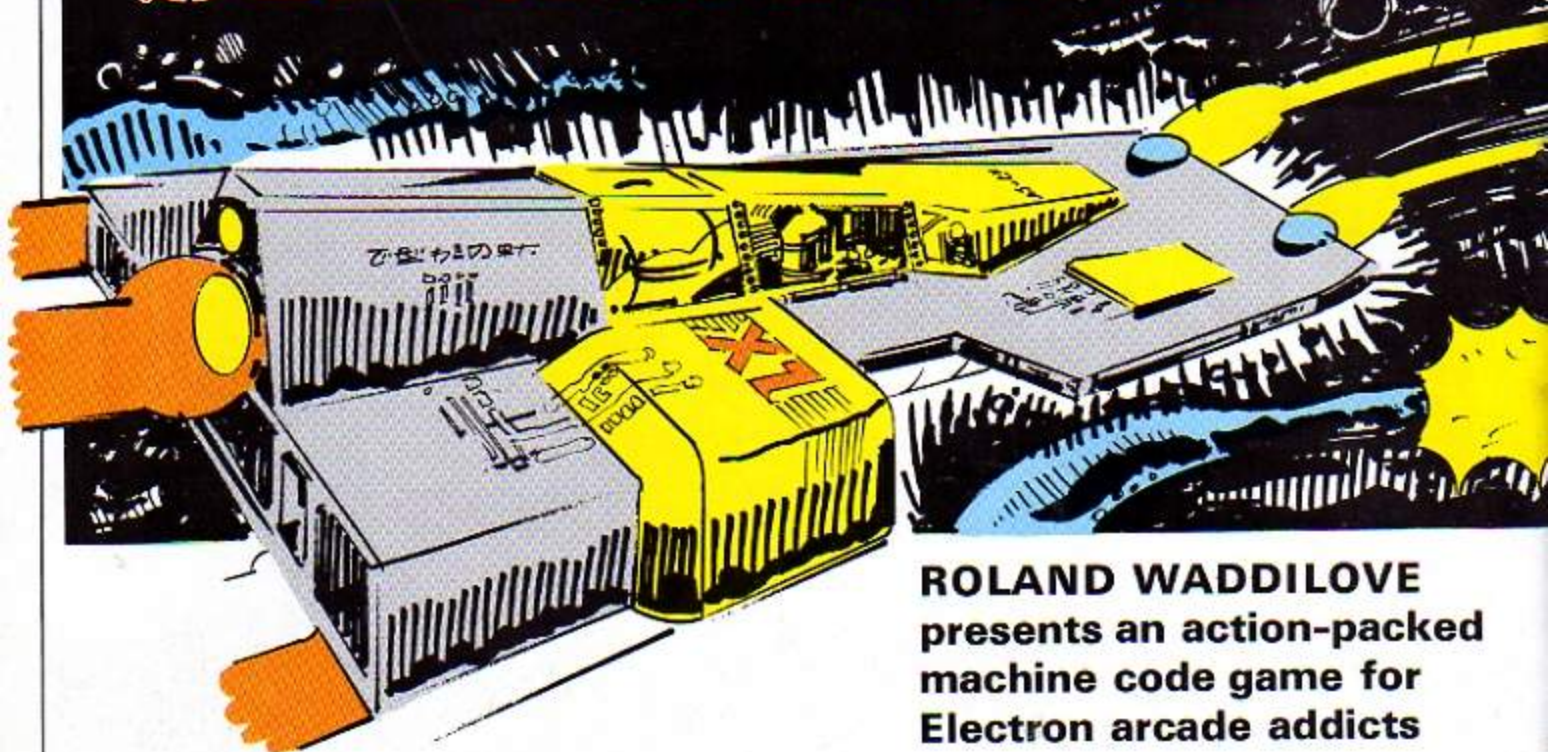
**Mike  
Bibby**

Getting started in  
**BBC Basic**  
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DATABASE PUBLICATIONS



# SKRAMBLE!



**ROLAND WADDILOVE**  
presents an action-packed  
machine code game for  
Electron arcade addicts

**HERE** is another high speed action packed machine code game for all arcade addicts. Your objective is to fly your X1 fighter fast and low over a rolling landscape, penetrating deep into enemy territory.

Destroy as many enemy planes, saucers and missiles as you can, but watch out for the exploding wreckage as you fly past - one touch and you've had it!

The further you progress

the harder it becomes as the number of enemy craft increases at an alarming rate.

There is a high score table, selectable start speed and level options, sound on/off and you can use joysticks if you have a Plus 1.

The whole of the game is in machine code for speed and multicoloured graphics.

The screen memory is accessed directly rather than using the operating system, so it nips along at quite a rate of

knots on level 9.

Basic is used for the instructions and high score table, as speed is not essential here. If you have the January *Electron User's* Space Battle somewhere on tape or disc then you can save yourself a lot of typing. Several procedures have been taken from this and tagged on to the end of Skramble so delete the lines you don't need and renumber the rest.

PROCanother, PROC-

hi\_score, PROCinitialise, PROCpause, PROCscroll, PROCbig(string\$) and PROCtune have been used. Most of the lines are the same but there are one or two minor changes.

There are very few variables as it's machine code; joy is a flag to show whether the joystick option has been chosen, scores%(10) and name\$(10) are used in the high score table. S% is the start speed and L% is the level.

## Skramble listing

```
10 REM Skramble
20 REM By R.A.Waddilove
30 REM (C) Electron User
40 ON ERROR RUN
50 IF PAGE>E000 PROCrelate:END
60 MODE 4
70 PROCinstructions
80 MODE 5:HIMEM=&5100
90 PROCassemble: CLEAR
100 PROCinitialise
110 REPEAT
120 PROCgame
130 PROCanother
140 UNTIL INSTR("Nn",key$)
```

```
150 MODE 6
160 END
170
180 DEF PROCinstructions
190 *FX11,0
200 *FX4,1
210 VDU 22,4,23,1,0;0;0;0;19,0,4;0;1*FX16,0
220 PRINT TAB(10,1):PROCbig("S K R A M B L E *"):
*FX210,0
230 PRINT"" You are on a dangerous mission flying "" deep into enemy territory. Your task"" is to destroy as many alien fighter
```

s"" and missiles as possible."

```
240 PRINT"" Your plane is equipped with powerful"" missiles which are capable of turning"" enemy craft into fireballs on impact."
```

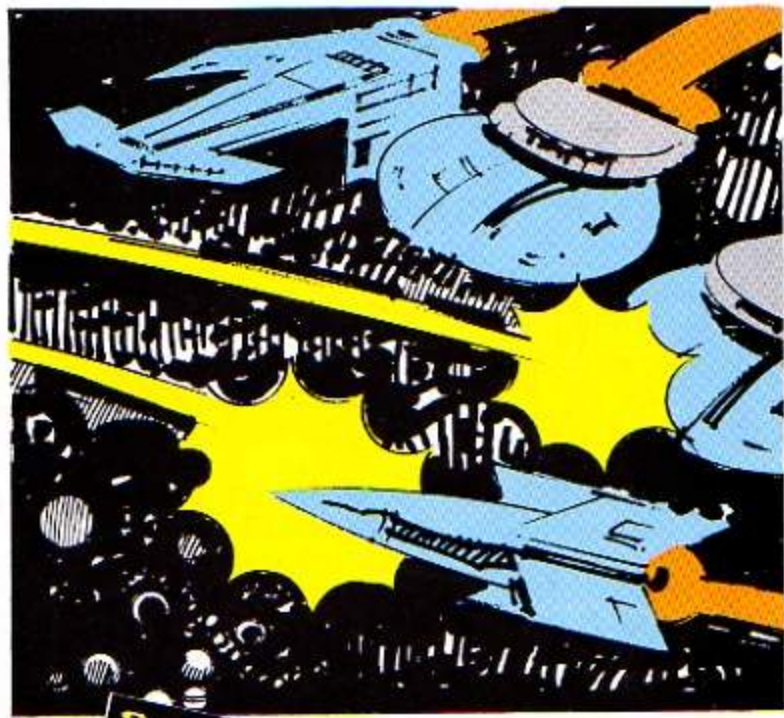
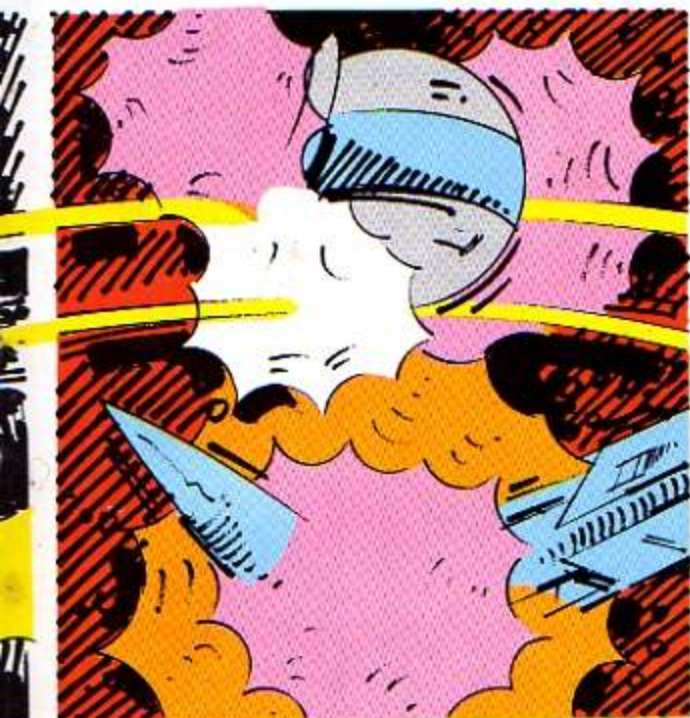
```
250 PRINT"" Be careful, one touch from an object"" and your plane will disintegrate."
```

```
260 PRINT""TAB(0)"Press the SPACE bar..."*FX21,0
270 MOVE 0,900:DRAW 0,102
310DRAW 1276,1023:DRAW 1276,
```

```
0:DRAW 0,0:DRAW 0,900:DRAW 1276,900
```

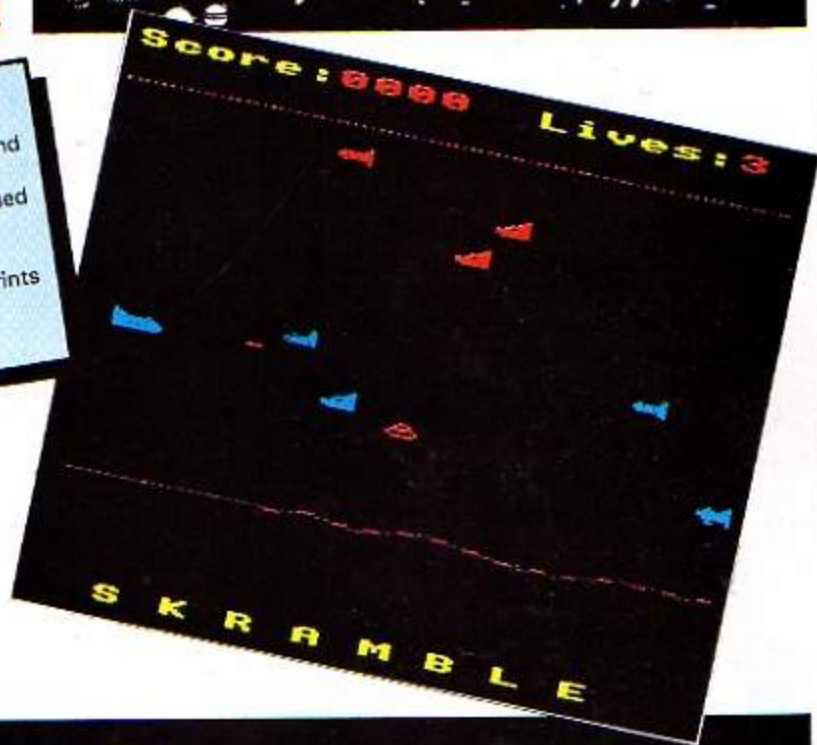
```
280 COLOUR 129:COLOUR 0:P
ROCscroll:COLOUR 128
290 VDU 28,1,30,30,5,12
300 COLOUR129:PRINT TAB(3,20)" Press number to select option ":COLOUR128:COLOUR 1:PRINT TAB(3,23)"A=up Z=down RETURN=fire"
310 RESTORE 460:FOR IX=1 TO 5:READ a$:READ b$:PRINT TAB(4,3*IX-1):PROCbig(STR$(IX)+". "+a$+STRING$(25-LEN a$,"")+b$):NEXT
320 AX=1:BX=AX:*FX210,0
```





## PROCEDURES

**instructions** Prints the instructions, sets the start level and speed, joystick and sound on/off options.  
**game** Resets the variables, sets up the tables used and calls the machine code.  
**assemble** Assembles the machine code.  
**another** Calls PROC hi\_score if the best so far. Prints the high score table.  
**big** Prints double height letters.



```
330 SX=4:LX=4:joy=FALSE:
FX16,0
340 REPEAT key$=GET$:FX2
1,0
350 IF key$="1" AX=-AX
360 IF key$="2" BX=-BX
370 IF AX>0 PRINT TAB(32,
2);:PROCbig("S");:FX210,0
380 IF AX<0 PRINT TAB(32,
2);:PROCbig("Q");:FX210,1
390 IF BX>0 PRINT TAB(32,
5);:PROCbig("K");:joy=FALSE:
FX16,0
400 IF BX<0 PRINT TAB(32,
5);:PROCbig("J");:joy=TRUE:
FX16,2
```

```
410 IF key$="3" LX=(LX+1)
MOD9:PRINT TAB(32,8);:PROCb
ig(STR$(LX+1))
420 IF key$="4" SX=(SX+1)
MOD9:PRINT TAB(32,11);:PROC
big(STR$(SX+1))
430 UNTIL key$="5"
440 ENDPROC
450
460 DATA Sound/quiet,S, K
eyboard/joystick,K,Start le
vel,5,Speed,5,Start,?
470
480 DEF PROCgame
490 !score=0: ?speed=10-SX
!level=255-LX*25
```

```
500 COLOUR 3:PRINT TAB(2,
31)"S K R A M B L E";
510 COLOUR 2:PRINT TAB(0,
1)"Score:0000";TAB(12,1)"Li
ves:"
520 FOR lives=3 TO 1 STEP
-1
530 GCOL 0,1:MOVE 0,900:P
LOT 21,1200,900
540 PRINT TAB(10,1);lives
550 FOR IX=0 TO 70 STEP 2
!X!qtable=&7740+IX*4:NEXT
560 FOR IX=0 TO 70 STEP 4
!X!atable=0:NEXT
570 FOR IX=0 TO 70 STEP 4
!X!dtable=0:NEXT
```

```
580 FOR IX=0 TO 40 STEP 2
!X!tablel=&5CF0+&140+IX/2:
NEXT
590 !plane=&6210: ?dead=0
600 FOR IX=0 TO 23:IX?&62
10=IX?pdata:NEXT
610 TIME=0:CALL HIMEM:FX
21,0
620 PROCpause(200):VDU 28
,0,30,19,2,12,26
630 NEXT
640 ENDPROC
```



## From Page 33

```

650
660 REM fireballs
670 DATA 12,61,4B,AS,96,4
8,34,12,92,2C,58,A4,29,94,B
,24 16
680 DATA 10,61,43,96,96,4
3,25,10,A1,C,9,2C,28,85,2.A
1 16
690 REM plane
700 DATA 8B,CC,EE,9F,FF,E
7,E7,F7,0,0,0,FF,FF,F,F,FF,
0,0,98,44,EE,3E,3E,EE 24
710 REM fighter1
720 DATA 0,0,0,2,5,F,3F,7
,0,1,3,3,3F,F,DE,1E 16
730 REM fighter2
740 DATA 0,22,55,FF,CF,77
,22,33,11,33,47,FF,3E,FE,11
,11 16
750 REM fighter3
760 DATA 0,0,0,11,22,FF,C
F,77,11,33,77,DF,77,FE,3E,F
F 16
770 REM missile
780 DATA 0,0,47,9F,9F,47,
0,0,1,12,F,3C,3C,F,12,1 16
790 REM saucer
800 DATA 0,10,20,70,81,84
,70,0,0,80,40,E0,10,12,E0,0 16
810 REM missile2
820 DATA 0,0,4,78,78,4,0,
0,0,66,EF,DE,DE,EF,66,0 16
830
840 DEF PROCassemble
850 pdata=&5720:odata=&57
28:REM actually &5738
860 fireball=&5700
870 RESTORE 660:FOR I%=0
TO 151:READ a$:I%=&5700:EVA
L("&*+a$):NEXT
880 gtable=&900:REM groun
d
890 atable=&900+80:REM ob
jects addresses
900 dtable=&900+160:REM o
bjects data addresses
910 tble1=&900+240:REM r
ight column addresses
920 old=&70:new=&72:seed=
&74:count=&75:rows=&76:colu
ms=&77
930 olddata=&78:newdata=&
7A:plane=&7C:flags=&7E:icol
=&7F:laser=&80

```

```

940 score=&82:dead=&86:sp
eed=&87:level=&88
950 osbyte=&20A AND &FFF
F:oswrch=&20E AND &FFFF:os
word=&20C AND &FFFF
960 FOR pass=0 TO 2 STEP
2
970 PZ=HIMEM
980 [ OPT pass
990 .main_loop
1000 JSR fire
1010 JSR move_plane:JSR te
st
1020 JSR flames
1030 DEC level+1:LDA level
+1:AND #7:BNE main1
1040 LDA level:CMP #20:BEQ
main1:DEC level
1050 .main1
1060 LDA speed:JSR wait
1070 JSR fire
1080 JSR move_plane:JSR te
st
1090 JSR ground
1100 LDA speed:JSR wait
1110 LDA #8:LDX #8F:LDY
#8FF:JSR osbyte:TYA:BNE re
turn \Escape?
1120 LDA dead:BEQ main_loo
p
1130 JSR blown_up
1140 .return
1150 RTS
1160
1170 .blown_up
1180 LDX #40
1190 .loop1
1200 TXA:PHA
1210 LDX #sound5 MOD 256:L
DY #sound5 DIV 256:LDA #7:J
SR osword
1220 JSR &AF51:LDA #2A:STA
olddata:ASL A:STA newdata:
LDA #90:STA olddata+1:STA n
ewdata+1
1230 LDA plane:STA old:STA
new:LDA plane+1:STA old+1:
STA new+1
1240 LDX #3:LDY #8:JSR pri
nt
1250 LDA speed:JSR wait
1260 JSR &AF51:LDA #2A:STA
olddata:ASL A:STA newdata:
LDA #80:STA olddata+1:STA n
ewdata+1:LDA plane:STA old:
STA new:LDA plane+1:STA old
+1:STA new+1:LDX #3:LDY #8:

```

```

JSR print
1270 JSR ground:LDA speed:
JSR wait
1280 PLA:TXA
1290 DEX:BNE loop1
1300 RTS
1310
1320 .sound1 EQU &0001001
1:EQU &004000C0
1330 .sound2 EQU 0:EQU &
11
1340 .sound3 EQU &FFF1001
0:EQU &000A0005
1350 .sound4 EQU &FFF1001
1:EQU &00020000
1360 .sound5 EQU &FFF1001
0:EQU &000A0004
1370 .time EQU 0:EQU 0
1380
1390 .wait
1400 PHA \save duration
1410 LDX #time MOD 256:LDY
#time DIV 256:LDA #1:JSR o
sword \read clock
1420 PLA:CMP time:BPL wait
\time up?
1430 LDA #0:STA time:STA t
ime+1:STA time+2:STA time+3
:STA time+4 \zero clock
1440 STA time+1:STA time+2
:STA time+3:STA time+4
1450 LDX #time MOD 256:LDY
#time DIV 256:LDA #2:JMP o
sword \&.return
1460
1470 .fire
1480 LDA icol:BNE la1 \la
ser fired:
1490 IF joy [OPT pass:LDX
#0:LDA #128:JSR osbyte:TXA:
] ELSE [OPT pass:LDA #81:L
DX #8B:LDY #8FF:JSR osbyte
:TYA \return pressed?:]
1500 [OPT pass
1510 BEQ la2
1520 LDA plane:AND #7:BNE
la2 \on line?
1530 CLC:LDA plane:ADC #24
:STA laser:LDA plane+1:ADC
#0:STA laser+1
1540 LDY #4:LDA (laser),Y:
BNE explosion \laser hit?
1550 LDA #FE:STA (laser),
Y:LDA #30:STA icol \fire
1560 LDX #sound1 MOD 256:L
DY #sound1 DIV 256:LDA #7:J
MP osword

```

```

1570 .la1 \move laser bo
lt
1580 LDY #4:LDA (laser),Y:
CMP #FE:BNE explosion
1590 CLC:LDA laser:STA old
:ADC #8:STA laser:LDA laser
+1:STA old+1:ADC #0:STA las
er+1
1600 LDA #0:STA (old),Y:LD
A (laser),Y:BNE explosion
1610 DEC icol:BEQ la3
1620 LDA #FE:STA (laser),
Y
1630 .la2 RTS
1640 .la3 LDX #sound2 MOD
256:LDY #sound2 DIV 256:LDA
#7:JMP osword \silence
1650
1660 .explosion
1670 LDX #0:STA icol
1680 CMP #96:BNE ex1
1690 LDX #sound4 MOD 256:L
DY #sound4 DIV 256:LDA #7:J
MP osword
1700 .ex1 LDX #sound3 MOD
256:LDY #sound3 DIV 256:LDA
#7:JSR osword
1710 LDX #sound2 MOD 256:L
DY #sound2 DIV 256:LDA #7:J
SR osword
1720 LDY #15
1730 .loop1
1740 LDA fireball,Y:STA (l
aser),Y
1750 DEY:BPL loop1
1760 LDY #76
1770 .loop1
1780 LDA atable,Y:CMP lase
r:BNE ex2
1790 LDA atable+1,Y:CMP la
ser+1:BEQ ex3
1800 .ex2 DEY:DEY:BNE loop
1
1810 RTS
1820 .ex3 LDA #fireball MO
D 256:STA dtable,Y:LDA #fir
eball DIV 256:STA dtable+1,
Y
1830 SED:CLC:LDA score+1:A
DC #5:STA score+1:LDA score
:ADC #0:STA score:CLD \sco
re=score+5
1840 LDA #31:JSR oswrch:LD
A #6:JSR oswrch:LDA #1:JSR
oswrch
1850 LDA score:LSR A:LSR A
:LSR A:LSR A:CLC:ADC #48:JS

```



```

R oswrch
1860 LDA score:AND #&0F:CL
C:ADC #48:JSR oswrch
1870 LDA score+1:LSR A:LSR
A:LSR A:LSR A:CLC:ADC #48:
JSR oswrch
1880 LDA score+1:AND #&0F:
CLC:ADC #48:JSR oswrch
1890 RTS
1900
1910 .flanes
1920 LDY #78
1930 .loop1
1940 LDA dtable,Y:AND #&EF:
BNE f11
1950 LDA dtable,Y:EOR #16:
STA dtable,Y
1960 .f11 DEY:DEY:BNE loop
1
1970 RTS
1980
1990 .move_plane
2000 LDA #pdata MOD 256:ST
A olddata:STA newdata:LDA #
pdata DIV 256:STA olddata+1:
STA newdata+1
2010 LDA plane+1:STA old+1:
LDA plane:STA old
2020 AND #7:BEQ mp4
2030 LDA #1:BIT flags:BEQ
mp5:BNE mp6
2040 .mp4 .mpup:]
2050 IF joy THEN [OPT pass
:LDX #2:LDA #&00:JSR osbyte
:TYA:AND #&C0:CMP #&C0:] EL
SE [OPT pass:LDA #&01:LDX #
&BE:LDY #&FF:JSR osbyte:INY
[ A pressed?:]
2060 [OPT pass
2070 BNE mpdown
2080 .mp5 LDA flags:AND #&
FE:STA flags
2090 SEC:LDA plane:AND #7:
BNE mp2
2100 LDA plane:SBC #&3A:ST
A plane:LDA plane+1:SBC #&1
:STA plane+1:JMP mp1
2110 .mp2 LDA plane:SBC #2
:STA plane:LDA plane+1:SBC
#0:STA plane+1:JMP mp1
2120 .mpdown:]
2130 IF joy THEN [OPT pass
:LDX #2:LDA #&00:JSR osbyte
:TYA:AND #&C0:CMP #&C0:] EL
S [OPT pass:LDA #&01:LDX #&
9E:LDY #&FF:JSR osbyte:INY
[ V pressed?:]
2140 [OPT pass
2150 BNE mp1
2160 .mp6 LDA flags:ORA #1
:STA flags
2170 LDA plane:AND #7:CMP
#6:BEQ mp3
2180 CLC:LDA plane:ADC #2:
STA plane:LDA plane+1:ADC #
0:STA plane+1:JMP mp1
2190 .mp3 CLC:LDA plane:AD
C #&3A:STA plane:LDA plane+
1:ADC #&1:STA plane+1
2200 .mp1
2210 LDA plane:STA new:LDA
plane+1:STA new+1
2220 LDA #19:JSR osbyte \
*FX19
2230 LDX #3:LDY #8:JSR pri
nt
2240 RTS
2250
2260 .ground
2270 LDA #19:JSR osbyte \
*FX19
2280 LDA atable+2:STA old:
LDA atable+3:STA old+1:BEQ
qrnoa
2290 LDA #0:LDY #15
2300 .loop1
2310 STA (old),Y
2320 DEY:BPL loop1
2330 .qrnoa LDX #2:LDY #0
2340 LDA qtable+2:STA old:
LDA qtable+3:STA old+1
2350 TYA:STA (old),Y
2360 .loop1
2370 INX:INX
2380 \move alien objects
2390 LDA dtable,X:STA dtab
le-2,X:STA olddata:LDA dtab
le+1,X:STA dtable-1,X:STA o
lddata+1
2400 SEC:LDA atable,X:STA
old:SBC #8:STA new:STA atab
le-2,X
2410 LDA atable+1,X:BEQ m
a2:STA old+1:SBC #0:STA new
+1:STA atable-1,X
2420 .loop2
2430 LDA (olddata),Y:STA (
new),Y:LDA #0:STA (old),Y
2440 INY:CPY #16:BNE loop2
2450 TAY:JMP na1
2460 .na2
2470 TYA:STA atable-1,X
2480 .na1
2490 \move ground

```



```

2500 SEC:LDA qtable,X:STA
old:SBC #8:STA new:STA qtab
le-2,X
2510 LDA qtable+1,X:STA ol
d+1:SBC #0:STA new+1:STA qt
able-1,X
2520 TYA:STA (old),Y
2530 LDA #&0F:STA (new),Y
2540 CPX #78:BNE loop1
2550 \next piece of ground
2560 LDA seed:ASL A:ASL A:
SEC:ADC seed:STA seed \sim
ple RND
2570 AND #128:BNE qrup
2580 LDA old+1:CMP #&7B:BP
L qr2 \too low?
2590 LDA old:AND #7:CMP #7
:BEQ qr1
2600 CLC:LDA old:ADC #1:ST
A old:LDA old+1:ADC #0:STA
old+1:JMP qr2
2610 .qr1 CLC:LDA old:ADC
#&39:STA old:LDA old+1:ADC
#&1:STA old+1:JMP qr2
2620 .qrup
2630 LDA old+1:CMP #&7B:BM
1 qr2 \too high?
2640 SEC:LDA old:AND #7:BE
Q qr3
2650 LDA old:SBC #1:STA ol
d:LDA old+1:SBC #0:STA old+
1:JMP qr2
2660 .qr3 LDA old:SBC #&39
:STA old:LDA old+1:SBC #&1:
STA old+1
2670 .qr2
2680 LDA old:STA qtable,X:
LDA old+1:STA qtable+1,X
2690 LDA #&F:LDY #0:STA (o
ld),Y
2700 \new alien object
2710 LDA level:STA #2A:STY
#2B:STY #2C:STY #2D:JSR &A
F12 \RND(level)
2720 LDA #2A:CMP #20:BCS q
rend:ASL A:PHA \right colu
mn address pointer
2730 LDA #6:STA #2A:JSR &A
F12 \RND(6)...alien object
s
2740 LDA #2A:ASL A:ASL A:A
SL A:ASL A:ADC #odata MOD 2
56:STA olddata:STA dtable+7
8:LDA #odata DIV 256:STA ol
ddata+1:STA dtable+79
2750 PLA:TAY:LDA table1,Y:
STA old:STA atable+78:LDA t
able1+1,Y:STA old+1:STA ata
ble+79
2760 LDY #15
2770 .loop1
2780 LDA (olddata),Y:STA (
old),Y
2790 DEY:BPL loop1
2800 RTS
2810 .qrend
2820 LDA #0:STA atable+79
2830 RTS
2840
2850 .print \uses new/old
/X=columns/Y=rows/olddata/n
ewdata
2860 STX columns:STY rows
2870 LDY #0
2880 LDA #2:STA count \is
t rub out old, then print n
ew
2890 .loop3
2900 LDA columns:PHA \sav
e columns
2910 .loop1
2920 LDA old+1:PHA:LDA old
:PHA \save address of colu
mn
2930 LDX rows
2940 .loop2
2950 LDA (olddata),Y:EOR (
old),Y:STA (old),Y
2960 CLC:LDA olddata:ADC #
1:STA olddata:LDA olddata+1
:ADC #0:STA olddata+1
2970 LDA old:AND #7:CMP #7
:BEQ bottom
2980 CLC:LDA old:ADC #1:ST

```



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```

A old:LDA old+1:ADC #0:STA
old+1:JMP next1
2990 .bottom \row
3000 CLC:LDA old:ADC #39:
STA old:LDA old+1:ADC #1:6
TA old+1
3010 .next1
3020 DEX:BNE loop2 \next
row
3030 CLC:PLA:ADC #0:STA ol
d:PLA:ADC #0:STA old+1
3040 DEC columns:BNE loop1
\next column
3050 PLA:STA columns \res
tore columns
3060 LDA new:STA old:LDA n
ew+1:STA old+1
3070 LDA newdata:STA oldda
ta:LDA newdata+1:STA olddat
a+1
3080 DEC count:BNE loop3
3090 RTS
3100
3110 .test \plane ok?
3120 LDA plane:STA old:LDA
plane+1:STA old+1
3130 LDA #pdata MOD 256:ST
A olddata:LDA #pdata DIV 25
6:STA olddata+1
3140 LDA #3:STA columns
3150 .loop1
3160 LDA old+1:PHA:LDA old
:PHA \save address of colu
mn
3170 LDX #0
3180 .loop2
3190 LDA (olddata),Y:CMPI
(olddata),Y:BNE te1:inc dead
3200 .tel CLC:LDA olddata:
ADC #1:STA olddata:LDA oldd
ata+1:ADC #0:STA olddata+1
3210 LDA old:AND #7:CMPI
#7:BNE te2
3220 CLC:LDA old:ADC #1:ST
A old:LDA old+1:ADC #0:STA
old+1:JMP te3
3230 .te2 \bottom row
3240 CLC:LDA old:ADC #39:
STA old:LDA old+1:ADC #1:6
TA old+1
3250 .te3
3260 DEX:BNE loop2 \next
row
3270 CLC:PLA:ADC #0:STA ol
d:PLA:ADC #0:STA old+1
3280 DEC columns:BNE loop1

```

```

\next column
3290 RTS
3300 1
3310 NEXT
3320 ENDPROC
3330
3340 DEF PROCrelate
3350 *KEY0 "TAPE:MDX:PAGE
-&E00:FORIX:PAGE TO TOP STE
P4:!(IX-DX)=!IX:NEXT:?(TOP-
DX)=255:MPAGE=&E00:MOLD:MRU
N:IFIM"
3360 *FX21,0
3370 *FX138,0,128
3380 ENDPROC
3390
3400 DEF PROCanother
3410 LOCAL SX,LX
3420 RESTORE 4260
3430 SX=1000*((?score AND
&F0)/DIV &10)+100*(?score AN
D &F)+10*((score?1 AND &F0)
DIV &10)+(score?1 AND &F)
3440 IF SX>scores%(10) PRO
Chi_score
3450 VDU20:CLS
3460 PRINT TAB(3);:PROCbig
("High Scores")
3470 COLOUR 2:PRINT ""
3480 FOR IX=1 TO 10
3490 IF ADVAL(-6)>3 PROctu
ne
3500 COLOUR 3:PRINT
3510 PRINT IX;".":COLOUR
2:PRINT TAB(3);name$(IX);TA
B(15);scores%(IX)
3520 NEXT
3530 COLOUR 1:PRINT ""
Another game ?""SPC(6);"(Y
or N)"
3540 REPEAT key$=INKEY#0
3550 IF ADVAL(-6)>3 PROctu
ne
3560 UNTIL INSTR(" YyNn",k
ey$)>1
3570 CLS:VDU19,3,6;0;
3580 ENDPROC
3590
3600 DEF PROCChi_score
3610 COLOUR 3:PRINT TAB(0,
5);
3620 PROCbig(" CONGRATULA
TIONS ")
3630 COLOUR 2:PRINT ""*Yo
u are in the""high score
table.""What is your name
?""*?";
3640 COLOUR 1:string$="":V

```

```

DU 23,1,1;0;0;0;
3650 REPEAT KX=INKEY#0
3660 IF ADVAL(-6)>3 PROctu
ne
3670 IF KX>31 AND KX<127 A
ND POS<11 string$=string$+C
HR$(KX):VDU KX
3680 IF KX=127 AND LEN str
ing$ string$=LEFT$(string$,
(LEN string$)-1):IF POS>1 V
DU KX
3690 UNTIL KX=13
3700 scores%(10)=SX:name$(
10)=string$
3710 FOR IX=10 TO 2 STEP -
1
3720 IF ADVAL(-6)>3 PROctu
ne
3730 IF scores%(IX)>scores
%(IX-1) SX=scores%(IX):scor
es%(IX)=scores%(IX-1):score
s%(IX-1)=SX:string$=name$(I
X):name$(IX)=name$(IX-1):na
me$(IX-1)=string$
3740 NEXT
3750 VDU 23,1,0;0;0;0;
3760 ENDPROC
3770
3780 DEF PROCinitialise
3790 DIM scores%(10),name$
(10)
3800 FOR IX=1 TO 10
3810 scores%(IX)=100-IX*1
00
3820 NEXT
3830 name$(1)="Electron":n
ame$(2)="User"
3840 name$(3)="Micro":name
$(4)="User"
3850 FOR IX=5 TO 10
3860 name$(IX)=name$(IX-4)
3870 NEXT
3880 ENVELOPE 1,2,-1,-2,-4
,150,10,10,126,0,0,-126,126
,126
3890 VDU 19,3,6;0;23,1,0;0
;0;0;
3900 plane=&7C:score=&82:d
ead=&86:speed=&87:level=&88
:pdata=&5720:gtable=&900:at
able=&900+80:dtable=&900+16
0:ttable=&900+240
3910 ENDPROC
3920
3930 DEF PROCpause(TX)
3940 TIME=0:REPEAT UNTIL T
IME>TX
3950 ENDPROC

```

```

3960
3970 DEF PROCscroll
3980 RESTORE 4260
3990 a$=STRING$(6," ")+"El
ectron User"+STRING$(6," ")
+"Micro User":b$=a$
4000 REPEAT b$=b$+a$
4010 REPEAT KX=INKEY#0
4020 PROctune
4030 PRINT TAB(3,30);LEFT$
(b$,34);
4040 b$=MID$(b$,2)
4050 UNTIL LEN b$=34 OR KX
=32
4060 UNTIL KX=32
4070 ENDPROC
4080
4090 DEF PROCbig(string$)
4100 LOCAL IX,AX
4110 FOR IX=1 TO LEN strin
g$
4120 ?&70=ASC(MID$(string$,
IX,1))
4130 AX=10:XX=&70:YX=0:CAL
L &FFF1
4140 FOR JX=0 TO 1
4150 VDU 23,225
4160 FOR KX=2 TO 9
4170 VDU ?(&70+4*JX+KX)DIV2
)
4180 NEXT
4190 VDU 225,10,8
4200 NEXT
4210 VDU 11,11,9
4220 NEXT
4230 ENDPROC
4240
4250 REM tune
4260 DATA 32,40,60,80,60,8
0,96,80,60,80,60,40,32,40,6
0,80,60,80,96,80,60,80,60,4
0
4270 DATA 20,40,60,80,60,8
0,100,80,60,80,60,40,20,40,
60,80,60,80,100,80,60,80,60
,40
4280 DATA -1
4290
4300 DEF PROCtune
4310 READ pitch:IF pitch<0
RESTORE 4260:READ pitch
4320 SOUND 1,-10,pitch,3
4330 ENDPROC

```

*This listing is included in this month's cassette tape offer. See order form on Page 61.*



# Software Surgery

THE COLUMN THAT TAKES A LOOK INSIDE THE LATEST RELEASES

## General Electron is hard to beat

THIS comes from Lothlorien's warmaster series of strategy games. It is set during the American War of Independence and is for one or two players.

On loading you're presented with a menu which gives you the option of creating your own battle or loading in one of five scenarios already defined.

These are re-creations of battles that actually took place and are spread over the period of the war. They present combinations of scenery and variations in the type and numbers of regiments involved.

Background information on each of the five battles, as well as full playing instructions, are given in the cassette insert.

I decided to see how Lothlorien did things before attempting to make my own maps, and so I pressed L from the menu to load the first battle.

When it loaded the menu was again presented. Incidentally, pressing Escape at any time will bring you back to the menu – especially useful if you are getting beaten.

On pressing P you are given the option of a one or two player game, whether you want to command the British or American forces if opting for the one player game, and the difficulty level you want to play at.

Throughout the games I played I could not detect any significant differences between any of the difficulty levels. The map is quickly drawn and each side then makes a move for each of their units.

There are four types of units, though the numbers of each vary with each battle.

### Redcoats Lothlorien

These are cavalry, artillery, riflemen and musketeers. The advantages and disadvantages of each are fully explained in the cassette insert.

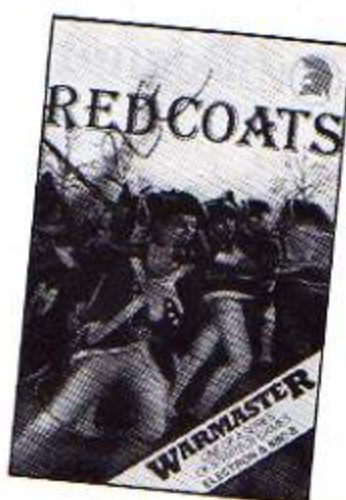
The musketeers and riflemen can move – in which case a direction and distance is prompted for – fire or charge.

In the latter two instances the enemy unit that is nearest is the one that is attacked. The cavalry also move as above but, since they only carry sabres, they cannot fire at the enemy. But they can charge and in doing so nearly always win.

The artillery fires at the nearest enemy unit but then uses one turn to reload.

If you want to move your artillery one turn is needed to get limbered up, one to move and then one to unlimber before it can fire again.

It's also possible to do



nothing and, since I could rarely figure out what devilish plan the Electron was putting into operation, this was the command I tended to make most use of.

When planning your own battle scene the other options in the menu are used. The first thing to do is to draw your map.

The numeric keys are used for this and each one is programmed for a specific item, such as, walls, trees and so on.

After drawing your map you choose the composition of your armies and various factors which determine its effective-

tiveness, like strength and morale.

You then deploy your units on the map, deciding whether they will adopt a position now or be reinforcements that will make an appearance during the course of the battle.

Once you're satisfied with the disposition of your forces you can save the scenario to tape and then play it out. If using the two player option you will obviously need to confer on the map and deploy your armies separately. At the end of each battle casualty figures are given and the winner gets their score.

With the Lothlorien games General Electron usually turns out to be a wily old bird who is difficult to beat. With Redcoats I found it fairly easy to win.

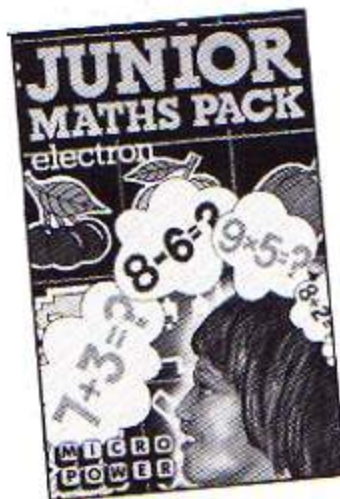
The two player game proved to be more interesting and challenging and generally a lot more fun.

Overall, another good strategy game. If you haven't already got one then I can recommend this one.

If you have, then you know what to expect and Redcoats is up to the level of the others in the series. Recommended.

Merlin

## Only one out of three...



### Junior Maths Pack Micro Power

THIS is a suite of three programs. The first, called Lander, is designed as a test of multiplication or division. The aim is to answer questions correctly, thereby boosting the lander higher into space.

Your turn ends when the lander touches down and you are given a score. There are numerous options – multiply or divide, choice of tables used and speed of lander.

I found the sound obtrusive and the game unexciting, but it all worked smoothly enough. I'd be tempted to use pencil and paper for this kind of task.

Game three, Number Spin, is designed to test addition

and subtraction and is based on a fruit machine. These devices with nudges and holds are a mystery to me, and I'm not sure we should encourage our youngsters into using them. I would not use this part of the program at home or at school.

The tape's salvation is program two, which is designed to give practice in coordinates.

The aim is to find objects hidden in a grid. You enter X



## From Page 37

and Y coordinates for your guess, and then an arrow points towards the object.

Humour comes into the game, because the object, when located, could be a treasure but might equally be an old bone or ugly mask.

When you have found four objects you get a score based on the value of your finds.

In 20 minutes on this program my seven year old son improved his grasp of coordinates and also started to use binary chopping to locate his objects.

He also got excited if he found a valuable treasure, which kept his interest.

At £6.95, I feel the coordinates program is worth it, but Lander and Number Spin are for me a waste of tape space.

Rog Frost

## Arcade cracker

**Gauntlet**  
Micro Power

FOR anyone who likes the traditional arcade type games, this is one for you. You're given sole control of an X15 space fighter and as you're zooming along over a decidedly hostile-looking terrain you find that your airspace isn't exactly friendly either.

Endless battalions of Reegs seem intent on knocking the



living daylights out of you as well as stealing the precious cannisters of... well, what it is that they're trying to steal is not quite clear, but it must be mighty important as your mission is to rescue as much as possible.

Happily you're not totally defenceless, as you can fire back at the Reegs. I advise you to do this, quickly and smartly. If you see a Reeg making off with a cannister shoot him and rescue the cannister. Placing it on the ground can be very point-profitable.

If the Reeg gets the cannister to the top of the screen it develops into a mutant and they're very hard to shake off.

As you go through waves of attack your problems become more and more frustrating. Mine layers, cruisers, buzzers and crawlers are just some of the computer nasties you'll meet appearing out of nowhere.

And by the way, don't let all your cannisters be destroyed, or everything will disintegrate

and you'll have a swarm of mutants on your hands.

Should all else fail, your smart bomb blows everything to smithereens.

All in all it's an enjoyable and fast-moving game for all the family. Graphics are well up to standard and the keys are simple to handle: A and Z for up and down, Shift for thrust, Return for fire, and Caps lock for the smart bomb.

Good stuff. A must for arcade freaks.

Keith Young

## Make a million

**Millionaire**  
Incentive

HERE you play a home computer programmer who has decided to go into business selling your own products.

Since the program typifies the decisions that have to be made in real life you'll soon be wishing you hadn't bothered!

You start by deciding what kind of programs you want to write - arcade games, adventures, educational programs, and so on. Naturally I decided on adventures.

You then have to decide what aspects of your programming you want to highlight. To do this you have 20 points that have to be allocated to different features, quality of programming, addictiveness,

packaging and such like.

Since I had chosen adventures I gave the maximum eight points to programming, five to packaging and seven to addictiveness.

I can definitely say that judging from my performance this is not the right way to allocate your points.

You are then given an option to sell your program to raise money to add to your original investment of £500. The decision made, you enter into the game.

The game is cycled monthly until you are either bankrupt or have made a quarter of a million pounds profit. If this figure is reached the Electron assumes you have the financial acumen to be a millionaire and ends the game.

At least I assume it does, I couldn't get that far. Each month you make decisions which are totalled to give a monthly run down on the state of your business.

This shows the number of programs you have on the market, your sales, stock, rates payable, assets and any outstanding loans.

You are then given the options for the month. You can write a program, sell your products to retailers, convert your existing programs to other computers, try to obtain a loan, sell out - which will give you your score - or see Honest Harry, who will undoubtedly try to sell you a load of cheap cassettes at a bargain price.

To increase your profit you are asked how much you wish to spend on advertising, how much you wish to spend on duplicating cassettes and how many you want duplicated.

Your decisions are evaluated and the program then gives you a news sheet - which in my case always seemed to mean bad news.

Then you are shown a graph displaying your sales figures for the year, and finally the run down of your business again.

It generally took me between one and two years to need a bank loan. This is where I discovered the only bug in an otherwise professional program. You are allowed to borrow £1,000 each month.

Once you take out a loan you are charged 10 per cent interest a month. I borrowed

## A touch of the horrors

AFTER climbing a rocky path to the old house you pass through the rusty gates and enter a creepy old mansion. Your task is to recover the golden keys which are spread over the five floors.

The house is haunted by a variety of ghosts, zombies, werewolves, vampires and mummies. To make matters worse each floor is like a maze, with rooms, corridors, secret passages and rotten floorboards which collapse when you walk on them.

Each floor is drawn as a plan showing the rooms and

**House of Horrors**  
Kay-Ess Computer  
Products

corridors, the keys, floorboards, passages and the house's horrors.

You start by the staircase and your task is to collect the two keys and return without bumping into any of the inhabitants.

There is no time limit, so you can plan your route. If you succeed you move on to the next level.

The options available at the

start are sound on/off, keyboard/joystick and start level. It is also possible to freeze the game at any point.

All the characters are single colour, user defined graphics characters. The monsters all move in fixed patterns and their movement is very jerky - one character position at a time.

This gives the game an amateurish look.

I think you will be disappointed with House of Horrors and cannot really recommend it.

Roland Waddilove



£1,000 and six months later owed £7,600!

I've heard of inflation, but this is ridiculous.

It appears that if you borrow money one month and do not pay it off the next you are treated as if you borrow money *each* month, though you don't, at least, pay interest on all of it.

This program has been available on at least one other computer for a while. Although a truly professional job it is not that different from other similar games already available.

Overall, somewhat marred by that bug discussed earlier. The rest of the program is superior, though similar, to other strategy games currently available.

Merlin

## Take to the stars

**Starfinder**  
Century Software

THIS BBC/Electron program is described as a starfinder and home planetarium. It comes in a very plush library case, complete with a book of about 140 pages.

Chapter one in the book is designed to help you with the software (you'll certainly need that). The bulk of the book is a treatise on astronomy. Most of the text could be read by an intelligent older teenager.

The program itself loads very smoothly to present a menu of options. To start with you enter date, time, position and which way you wish to look. This is fairly straightforward.

You may then look at a section of sky. This rather untidy screen plots stars very slowly. It takes about a minute to complete.

Using the "space probe" (a small cross) you may identify any star shown by positioning the probe on the star. The screen displays information in the form Az=W15 Alt=31 Omicron Cet!!! This cryptic clue is somewhat explained in the text.

Incidentally, the program includes planets, the Sun and Moon and even Halley's

Comet as well as stars.

Having got your display you can change your direction of view left or right by 45 degrees or look up instead of along (with a one minute pause). You can also move forward in time.

Returning to the menu (Escape) gives you the chance to search for any of the heavenly bodies contained in the program. The computer will display them at your specified time or at their highest point in the sky.

This can be of great interest. For example, as you eat your Christmas tea in 1985, Halley's Comet will be at a height of 36 deg between

south and west and Jupiter will be beneath it. While search and time stepping facilities are excellent, the screen star maps take a lot of getting used to, but with perseverance constellations can eventually be learned.

One particularly useful function for the lucky few is the ability to print a star map at the touch of P. This produces a high quality screen dump on Epson-compatible printers.

Overall this seems a worthwhile program for the enthusiastic astronomer, but perhaps rather overpriced at £12.95.

Rog Frost

## Spiders and snakes

**Serpents Lair**  
Comsoft

THIS adventure program is designed to be used by children in the age range seven to twelve. It concerns the rather unpleasant Princess Ambrosia who was sent on a mission to find the King's treasure.

The trouble is she found a good sweet shop in Bognor Regis and there she stopped, stuffing herself with sweets.

Guess what? You are sent in her place, equipped with a magic carpet.

Most unusually for an adventure, the action takes place on planet Earth, with geographical locations such as Loch Ness, the Arizona Desert and Indonesia. Many of these places are drawn out in high resolution colour graphics.

The locations are in their (reasonably) correct geographical positions so that if you go east from London you will get to Egypt or west from Japan takes you to India.

It is recommended in the instructions that the game is played with an atlas, and this, of course, gives the program some educational value.

A number of animals are met on the way, ranging from polar bears to tarantula spiders (again, mostly in their correct regions) and it is necessary to aid these or outwit them.

An experienced adventurer

would solve the problems with ease. They are designed to be easy, so that when the tiger wants meat it will be found near at hand.

My own son, aged seven, got tremendous satisfaction from working out how to pass the Comodo Dragon.

The program comes with a couple of sheets of paper which give you the story so far, and some general instructions for getting going. These are invaluable to the novice adventurer.

There is also a function key strip, the keys being set up for 10 common commands.

There seemed to be one bug here as the GET command did not work.

You are even given the phone number of Comsoft's chief adventurer which you can phone if stuck.

My family nearly resorted to this service to solve the riddle of the sphinx.

This is a most satisfying program. It offers a gentle introduction to adventures and could well suit many adults as well as children.

It was thoroughly enjoyed by my son, who took three days, with help, to solve it.

The package is priced very reasonably and the program loads and runs just as well on a BBC Micro and could be of interest to the growing numbers of schools which use both machines.

Rog Frost

## Updated classics

**Planetoid**  
Acornsoft

PLANETOID was one of the original BBC Micro games from Acornsoft and proved to be extremely popular.

I must admit I viewed the Electron version with some suspicion thinking that it may be slower in action or response. I was pleased to find out that it is neither.

The game performs to expectations and in addition has some facilities the BBC version lacked.

The objective is to patrol the surface of a planetoid and protect its life forms from the raiders. The raiders attempt to capture the life forms and carry them into space.

By use of lasers and smart bombs the raiders must be prevented from reaching outer space (the top of the screen).

Failure causes the raider to mutate. Be warned. A mutated raider makes a normal raider look passive and harmless.

As if that wasn't enough, in addition to the raiders and mutants come the bombers, cruisers and megacytes. The latter are particularly nasty because they burst into a cloud of spores, each spore being extremely dangerous.

At the start you have three laser ships and three smart bombs, which kill all alien forms on the screen at the moment of detonation.

The screen display is excellent. In addition to the surface of the planetoid, it also includes a long range view of the activities of the raiders, score updates and symbols representing the number of laser ships and smart bombs left.

Unlike my BBC version, this one has the ability to pause the action and then restart - or to press Escape and return to the start. The sound can be switched on or off at any stage.

It's fast and fun, annoying and addictive. In fact, it's one of the classic micro arcade games no Electron owner should be without.

John Woollard



**Out of the many thousands of programs submitted to Electron User... out of the dozens that have been considered good enough to appear in these pages... we have selected 20 of the most outstanding to delight, intrigue – and frustrate! – Electron users everywhere.**



**Only  
£5.95  
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*Please use the  
order form  
on Page 61*



**Volume 1 contains:**

- Jam Butty**  
Machine code simulation of high drama on a building site.
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Fast and furious action as you batter down a brick wall.
- Money Maze**  
Avoid ghosts and collect coins in an all-action arcade classic.
- Lunar Lander**  
The traditional computer game specially written for the Electron.

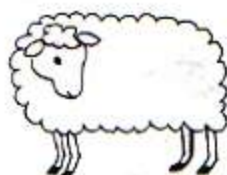
**Volume 2 contains:**

- Atom Smash**  
Machine code thrills as you help to save the world from destruction.
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Go egg collecting, but keep away from the proliferating rabbits.
- Castles of Sand**  
Build castles – but beware the rising tide and hungry sandworms.
- Reaction Timer**  
Test your reactions with this traffic lights simulation.
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The Electron version of the age-old game of logic and patience.
- Jumper**  
Jump for your life in this exciting arcade action game.
- Break Free**  
Test your wits and reflexes in this popular classic ball game.
- Code Breaker**  
Crack the code in a colourful if frustrating brainteaser.
- Parachute**  
Save the plunging sky divers from a watery end.
- Star Fighter**  
Attack the bandit ships in this fast-moving 3D punch up.



No room for woolly thinking in ROG FROST's

# SHEEP nim



IN this version of the ancient two-player game of Nim you must pit your wits against your Electron.

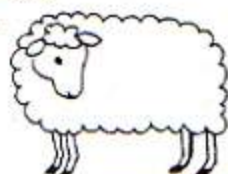
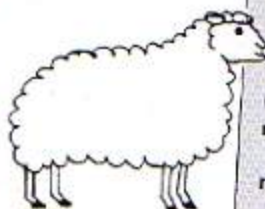
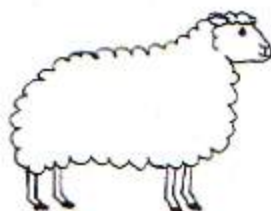
The game starts with three rows of sheep displayed on the screen. You and your micro

take it in turns to remove as many sheep as you like, but you may only disturb one row per move.

The object is to force your opponent to take the last sheep.

The micro keeps the score and lets you know the winner after a series of games.

Don't be sheepish — type in the program and see how NIMble-brained you are.



## ARRAYS

- pos%(3)** Contains the number of characters in each row.
- change%(3)** Temporary stores used by the micro when making its move.
- flag%(3)**
- score%(2)** Holds player's and micro's score.
- pos\$(3)** String containing pos%(3) characters.



## PROCEDURES

### PROCinit

Sets up arrays, defines sheep and arrow characters, gives instructions and obtains players' names and number of games required.

### PROCsetup

Decides on the length of each of the three rows, creates the strings of characters, defines the game variables.

### PROCscreen PROCplayer

Draws the three rows of sheep. Makes sure the arrow can only point at a place where there are still sheep. It allows the player to move the arrow and delete sheep.

### PROCcomp PROCscore PROCend ERROR HANDLER

Allows the micro to take sheep. Keeps and displays a record of scores. Displays a final message. Returns to Mode 6 when Escape is pressed and sets the keyboard auto-repeat back to normal.

| VARIABLES            |   |
|----------------------|---|
| <b>howmany%</b>      | Equals number of games requested.   |
| <b>xpos%, ypos%</b>  | Screen coordinates of the arrow.  |
| <b>top%, bottom%</b> | Set limits to positions of arrow.   |
| <b>jump%</b>         | Gives the vertical distance the arrow moves.  |
| <b>pass%</b>         | Set to 0 to get the correct colours initially set to 1 to allow player to move.           |
| <b>GS</b>            | Key pressed by player.  |
| <b>remove\$</b>      | Section of row to be removed.   |
| <b>mem%</b>          | Temporary memory to help micro make decision.   |
| <b>Colours</b>       | Set up by VDU19 commands at line 350. If you use monochrome, you may want to change them. |

```

10 REM NIM
20 REM by Rog Frost
30 REM assisted by Brian
Frost
40 REM (C) Electron User
50 *F1282
60 MODE6:VDU19,0,4;0;23;
0;0;0;0;0;0;
70 ON ERROR GOTO1350
80 PROCinit
90 FORgame%=1TO howmany%
100 PROCsetup
110 MODE5
120 VDU23;820;0;0;0;0;
130 REPEAT
140 COLOUR2:CLS
150 PROCscreen
160 PROCplayer
170 CLS:PROCscreen
180 IF pos%(1)=0 AND pos%
(2)=0 AND pos%(3)=0 CLS:PRI
NT "HARD LUCK" I WIN!
190 score%(1)=score%(1)+1:GO
10200
190 PROCcomp
200 UNTIL pos%(1)=0 AND p
os%(2)=0 AND pos%(3)=0
210 PROCscore
220 NEXT
230 PROCend
240 REPEATUNTILGET=32:RUN
250 END
260 DEFPROCsetup
270 pos%(1)=RND(7)+3:pos%
(2)=RND(7)+3:pos%(3)=RND(7)
+3
280 pos$(1)=STRING$(pos%(
1),CHR$(224)+" ")
290 pos$(2)=STRING$(pos%(
2),CHR$(224)+" ")
300 pos$(3)=STRING$(pos%(
3),CHR$(224)+" ")
310 xpos%=1:ypos%=20
320 bottom%=19:top%=5:jue
p%=7
330 ENDPROC
340 DEFPROCscreen
350 VDU19,0,3;0;19,3,0;0;
19,2,4;0;19,1,1;0;0;
360 PRINTTAB(1,4)pos$(1)
370 PRINTTAB(1,11)pos$(2)
380 PRINTTAB(1,18)pos$(3)
390 ENDPROC
400 DEFPROCplayer
410 ypos%=20
420 IF pos%(1)=0 top%=14

```



## From Page 41

```

430 IF pos%(1)=0 AND pos%(
2)=0 top%=21
440 IF pos%(2)=0 jump%=14
450 IF pos%(3)=0 ypos%=13
:bottom%=12
460 IF pos%(3)=0 AND pos%
(2)=0 ypos%=6: bottom%=6
470 COLOUR1
480 PRINTTAB(1,24)name$;"
's turn"
490 COLOUR2
500 PRINT "A...up Z...do
wn""<...left >...right"
"Return to end turn."
510 PRINTTAB(xpos%,ypos%)
CHR$225
520 pass%=0:G$=""
530 REPEAT
540 IF pass%=1 G$=GET$
550 pass%=1
560 COLOUR0:PRINTTAB(xpos
%,ypos%)CHR$225
570 *FX15,0
580 IF G$="," AND xpos%>1
xpos%=xpos%-2
590 IF G$="," xpos%=xpos%+
2
600 IF ypos%=20 AND xpos%>
2*pos%(3) xpos%=1
610 IF ypos%=13 AND xpos%>
2*pos%(2) xpos%=1
620 IF ypos%=6 AND xpos%>2
*pos%(1) xpos%=1
630 IF G$="A" AND ypos%>to
p% ypos%=ypos%-jump%:xpos%=
1
640 IF G$="Z" AND ypos%<b
ottom% ypos%=ypos%+jump%:xp
os%=1
650 COLOUR2:PROCscreen
660 PRINTTAB(xpos%,ypos%)
CHR$225
670 IF ypos%=20 remove$=S
TRING$(pos%(3)-xpos%DIV2,CH
R$224+" "):COLOUR3:PRINTTAB
(xpos%,18)remove$
680 IF ypos%=13 remove$=S
TRING$(pos%(2)-xpos%DIV2,CH
R$224+" "):COLOUR3:PRINTTAB
(xpos%,11)remove$
690 IF ypos%=6 remove$=S
TRING$(pos%(1)-xpos%DIV2,CH
R$224+" "):COLOUR3:PRINTTAB(
xpos%,4)remove$
700 UNTIL G$=CHR$13
710 SOUND1,-15,100,2

```

```

720 IF ypos%=20 pos%(3)=x
pos%DIV2:pos%(3)=STRING$(po
s%(3),CHR$224+" ")
730 IF ypos%=13 pos%(2)=x
pos%DIV2:pos%(2)=STRING$(po
s%(2),CHR$224+" ")
740 IF ypos%=6 pos%(1)=xp
os%DIV2:pos%(1)=STRING$(pos
%(1),CHR$224+" ")
750 ENDPROC
760 DEFPROCcomp
770 COLOUR3:CLS:PROCscree
n
780 COLOUR2
790 PRINTTAB(1,24)"MY TUR
N NOW"
800 TIME=0
810 FOR N%=1 TO 3:change%(N%
)=pos%(N%):flag%(N%)=N%:NEX
T:mea%=2
820 IF change%(1)>change%
(2) store%=change%(2):chang
e%(2)=change%(1):change%(1)
=store%:flag%(1)=2:flag%(2)
=1:mea%=1
830 IF change%(2)>change%
(3) store%=change%(3):chang
e%(3)=change%(2):change%(2)
=store%:flag%(2)=3
840 IF change%(1)>change%
(2) store%=change%(2):chang
e%(2)=change%(1):change%(1)
=store%:flag%(2)=flag%(2)-m
ea%:flag%(1)=3
850 flag%(3)=6-flag%(1)-f
lag%(2)
860 IF change%(2)=0 AND c
hange%(3)=1 CLS:PRINT""YOU
WIN":pos%(flag%(3))=0:scor
e%(2)=score%(2)+1:GOTO1040
870 IF change%(2)=0 pos%(
flag%(3))=1:pos%(flag%(3))=
CHR$224:GOTO1020
880 IF change%(2)=1 AND c
hange%(1)=0 pos%(flag%(3))=
0:pos%(flag%(3))="":GOTO102
0
890 IF change%(1)=0 AND c
hange%(2)=2 AND change%(3)>
2 pos%(flag%(3))=2:pos%(fla
g%(3))=STRING$(pos%(flag%(3
)),CHR$224+" "):GOTO1020
900 IF change%(2)=change%
(3) AND change%(3)>2 pos%(f
lag%(3))=2:pos%(flag%(3))=S
TRING$(pos%(flag%(3)),CHR$2
24+" "):GOTO1020
910 IF change%(1)=0 AND cha

```

```

nge%(3)>4 pos%(flag%(3))=po
s%(flag%(3))-3:pos%(flag%(3
))=STRING$(pos%(flag%(3)),C
HR$224+" "):GOTO1020
920 IF change%(1)=0 pos%(
flag%(3))=pos%(flag%(3))-1:
pos%(flag%(3))=STRING$(pos%(
flag%(3)),CHR$224+" "):GOT
O1020
930 IF change%(1)=1 AND c
hange%(2)=2 AND change%(3)=
3 pos%(flag%(2))=1:pos%(fla
g%(2))=CHR$224:GOTO1020
940 IF change%(1)=1 AND c
hange%(2)=1 AND change%(3)>1
pos%(flag%(3))=1:pos%(fla
g%(3))=CHR$224:GOTO1020
950 IF change%(2)=2 AND c
hange%(1)=2 pos%(flag%(3))=
0:pos%(flag%(3))="":GOTO102
0
960 IF change%(1)+change%
(2)<=change%(3) pos%(flag%(
3))=pos%(flag%(3))-1:pos%(f
lag%(3))=STRING$(pos%(flag%
(3)),CHR$224+" "):GOTO1020
970 drop%=0
980 REPEAT
990 drop%=drop%+1
1000 UNTIL change%(1)+chan
ge%(2)-drop%=change%(3)
1010 pos%(flag%(2))=pos%(f
lag%(2))-drop%:pos%(flag%(2
))=STRING$(pos%(flag%(2)),C
HR$224+" ")
1020 COLOUR2:PROCscreen:FO
R delay%=1 TO 1000:NEXT:CLS:
PROCscreen
1030 SOUND1,-15,20,2
1040 ENDPROC
1050 DEFPROCinit
1060 DIM pos%(3),change%(3
),flag%(3),score%(2)
1070 DIM pos%(3)
1080 score%(1)=0:score%(2)
=0
1090 VDU23,224,64,170,255,
126,126,62,34,102
1100 VDU23,225,8,28,42,8,8
,8,8,8
1110 *FX11,0
1120 PRINTTAB(15,2)"SHEEP
NIM"TAB(15,3)"*****"
1130 VDU28,1,24,38,5
1140 PRINT "In this game yo
u play against your""Elect
ron. You and it take it in"
""turns to remove any numbe

```

```

r of sheep""from one row.
You will lose if you""have
to take the very last shee
p."
1150 PRINT "To select the
sheep you wish to""remove,
move the arrow by using:-"
"" A.....UP"" Z.....D
OWN"" <.....LEFT"" >
....RIGHT"
1160 PRINT "Black sheep ca
n then be removed by""pres
sing Return."
1170 PRINT "Press Space to
continue.":REPEATUNTILGET=
32:CLS
1180 INPUT""What is your
name ",name$:name%=LEFT$(n
ame$,9)
1190 REPEAT
1200 INPUT""How many gam
es do you want ",howmany%
1210 UNTIL howmany%>0
1220 ENDPROC
1230 DEFPROCscore
1240 PRINT""My score is
",score%(1)
1250 PRINT""Your score is
",score%(2)
1260 PRINTTAB(2,27)"Press
space":REPEATUNTILGET=32
1270 ENDPROC
1280 DEFPROCend
1290 myscore%=STRING$(scor
e%(1),CHR$224+" "):yourscor
e%=STRING$(score%(2),CHR$22
4+" ")
1300 CLS:COLOUR2:PRINT""
I SCORED ":myscore$""name$
":SCORED "yourscore$
1310 IF score%(1)=score%(2
) PRINT""IT'S A TIE"
1320 IF score%(1)>score%(2
) PRINT""I AM THE WINNER"
1330 IF score%(2)>score%(1
) PRINT""WELL DONE "name$
""YOU HAVE WON"
1340 ENDPROC
1350 REM error handler
1360 MODE6:REPORT:PRINT:"
at line ":ERL
1370 *FX12,0
1380 END

```

*This listing is included in this month's cassette tape offer. See order form on Page 61.*



L

I

F

E

**LIFE** is a program which simulates the growth of a colony of cells.

In effect it's a one player game invented around 1970 by John Conway of Cambridge University. It is basically a pattern generating program.

The growth of the colony is based on a few very simple rules — explained in the program — but the patterns produced can be quite spectacular.

In this version there is a colour option and either you can set up the parent generation yourself or there is a demonstration pattern which runs for about 100 generations!

**Roland Waddilove**



## PROCEDURES

### PROCinitialise

Switches off cursor keys, set flash rate for colours 8-15, define character 224.

### PROCInstructions PROCchoice

Prints instructions and rules.

Selects Mode 1 or 4. You can change mode within a procedure. Switches off cursor, draws borders of graphics windows, sets limits for size of parent generation.

### PROCscreen

Draws demonstration pattern. Allows you to set up initial pattern yourself.

### PROCdemo PROCsetup

Sets variables.

Pattern generating program. It looks at the last generation and draws the next according to the rules of Life.

### PROCstart PROClife

Draws a small square using triangles.

### PROCplot(A%,B%,Z%)

Sets up graphics window selected. Assembles a machine code routine to count number of neighbours a cell has (much simpler in Basic but twice as slow).

### PROCwindow(N%)

### PROCassemble

## VARIABLES

top, bottom  
left, right

Only the area within these limits is looked at. Increases as program proceeds. This speeds up first few generations.

C%

How many neighbours a cell has.

D%

Colour of cell being looked at.

G%

Number of generations.

M%

Mode selected.

X%, Y%

Coordinates of cursor in PROCsetup.

K%

Key pressed in PROCsetup.

A%, B%

Coordinates of cell to be plotted.

```

10 REM LIFE
20 REM By R.A.Waddilove
30 REM (C) ELECTRON USER
40 MODE 1
50 PROCassemble
60 PROCinitialise
70 PROCInstructions
80 ON ERROR IF ERR<>17 R
EPORT:END
90 PROCchoice
100 PROCscreen
110 IF demo PROCdemo ELSE
PROCsetup
120 PROCstart
130 REPEAT
140 PROClife
150 UNTIL INKEY=13
160 *FX4,0
170 *FX21,0
180 PRINT TAB(0,16)"END..
.";
190 END
200
210 DEF PROCinitialise
220 *FX4,1
230 *FX9,10
240 *FX10,20
250 *KEY10,"OLD:MRUN:M"
255 VDU 23,1,0;0;0;0;
260 VDU23,224,0,0,0,99,0,
0,0,0
270 ENDPROC
280
290 DEF PROCstart
300 IF M%1 VDU 19,2,5;0;
310 bottom=bottom-12
320 right=right+20
330 left=left+16
340 C%=0:D%=0:G%=0
350 PRINT TAB(27,20)"RETU
RN"TAB(24,22)"ends program"
TAB(28,24)"next"TAB(25,26)"
generation"
360 PRINT TAB(5,22)"ESCAP
E"TAB(3,24)"starts again"
370 ENDPROC
380
390 DEF PROCchoice
400 VDU 22,6
405 VDU 23,1,0;0;0;0;
410 PRINT""Which mode (1
or 4) ?";
420 REPEAT
430 M%=GET-40
440 UNTIL M%=1 OR M%=4
450 PRINT:M%
460 PRINT""Press S to se
t the pattern yourself,"""O
r D for the demonstration..
.";
470 REPEAT
480 key%=GET$
490 UNTIL INSTR("SsDd",ke
y$)
500 demo=FALSE
510 IF INSTR("Dd",key$) d
emo=TRUE
520 VDU 22,M%
530 ENDPROC
540
550 DEF PROCdemo
560 PROCwindow(0)
570 FOR IX=247 TO 359 STE
P 16
580 PROCplot(IX,227,3)
590 NEXT
600 PROCplot(247,243,3)
610 PROCplot(247,211,3)
620 PROCplot(359,243,3)
630 PROCplot(359,211,3)
640 ENDPROC
650
660 DEF PROCscreen
670 VDU 23,1,0;0;0;0;
680 VDU 19,3,2;0;19,1,6;0
;26
690 top=307:bottom=195
700 left=235:right=347
710 CLS:GCOL 0,1
720 PROCborder(0,531)
730 PROCborder(668,531)
740 PROCborder(0,0)
750 PROCborder(668,0)

```



## From Page 43

```

760 ENDPROC
770
780 DEF PROCborder (X,Y)
790 MOVE X,Y: DRAW X+60
800 Y
800 DRAW X+60,Y+460
810 DRAW X,Y+460: DRAW X
X,Y
820 ENDPROC
830
840 DEF PROCsetup
850 PRINT TAB(24,3)"Curso
r keys"TAB(24,4)"to move...
"TAB(24,6)"COPY places"TAB(
24,7)"cell..."TAB(24,9)"DEL
ETE erases"TAB(24,10)"cell.
.."TAB(24,12)"RETURN when"
TAB(24,13)"finished..."
860 X=283:Y=259
870 IF M=1 VDU19,2,0;
880 PROCwindow(0)
890 GCOL 3,M+1:MOVE X,Y
X:VDU5,224
900 REPEAT K=GET
910 IF K=127 OR K=135 P
ROCplot(X+12,Y-16,-3*(K=
135))
920 GCOL3,M+1:MOVE X,Y
:VDU224
930 X=X-16*(X<right AN
D K=137)+16*(X>left AND K
X=136)
940 Y=Y-16*(Y<top AND
K=139)+16*(Y>bottom AND K
Y=138)
950 MOVE X,Y:VDU224
960 UNTIL K=13
970 MOVE X,Y:VDU224,4
980 ENDPROC
990
1000 DEF PROCplot(AZ,BX,ZX
)
1010 IFM=1GCOL0,ZXELSEGCO
L0,SGNZX
1020 MOVEAX,BX:MOVEAX+8,BX
:PLOT85,AX,BX+8:PLOT85,AX+8
,BX+8:ENDPROC
1030
1040 DEF PROCwindow(NX)
1050 IFNX=0 VDU26,24,4:535
;684;995;29,4;535:ENDPROC
1060 IFNX=1 VDU26,24,672;5
35;1272;995;29,672;535:END
PROC
1070 IFNX=2 VDU26,24,672;4
;1272;464;29,672;4:ENDPROC
1080 IFNX=3 VDU26,24,4;4;6

```

```

04;464;29,4;4:ENDPROC
1090
1100 DEF PROClife
1110 PROCwindow((GX+1)MOD4
):CLG
1120 VDU5:MOVE96,250:GCOL0
,MX+1
1130 PRINT "Generation:";G
X+1:VDU4
1140 left=left-(16 AND lef
t>0)
1150 right=right+(16 AND r
ight<600)
1160 top=top+(16 AND top<4
56)
1170 bottom=bottom-(16 AND
bottom>0)
1180 VDU7:#FX21,0
1190 KZ=INKEY200:CLG
1200 FORJX=bottom TO top S
TEP16:FORIX=left TO right S
TEP16:PROCwindow(GXMOD4):CA
LL&A00:PROCwindow((GX+1)MOD
4):IFCX=20R(CX=3ANDDX>0) PR
OCplot(IX,JX,DX) ELSEIFCX=3
ANDDX=0 PROCplot(IX,JX,GXMO
D3+1)
1210 NEXT,
1220 GX=GX+1
1230 ENDPROC
1240
1250 DEF PROCinstructions
1260 PRINT TAB(15)"LIFE"
1270 PRINT TAB(14)"-----"
1280 PRINT CHR#17;CHR#2;"P
lace a group of cells in th
e centre of the screen and
watch how the pattern wo
uld grow if it were alive."
1290 PRINT CHR#17;CHR#3;"
Growth is based on a few si
mple rules -"
1300 PRINT CHR#17;CHR#2;"
1. A cell will live if it h
as two or three neigh
bours."
1310 PRINT "2. A cell will
die of overcrowding if it
has more than three neigh
bours."
1320 PRINT "3. A cell will
die of starvation if it
has less than two neighbo
urs."
1330 PRINT "4. A new cell
will be born in any space
with three neighbours."
1340 PRINT CHR#17;CHR#1;"
The program can be run in

```

```

MODE 1,(slow but colourful
), or in MODE 4, (faster
but less colourful).
1350 PRINT TAB(11);CHR#17
;CHR#3;"press space...";
1360 REPEAT
1370 UNTIL GET=32
1380 CLS
1390 ENDPROC
1400
1410 DEF PROCassemble
1420 block=&70:colour=&74
1430 osword=!&20C AND &FFF
F
1440 CX=&40C:DX=&410:IX=&4
24:JX=&428
1450 FOR pass=0 TO 2 STEP 2
1460 PX=&A00
1470 ( OPT pass
1480 .codeX
1490 LDA IX
1500 STA block
1510 LDA IX+1
1520 STA block+1
1530 LDA JX
1540 STA block+2
1550 LDA JX+1
1560 STA block+3
1570 JSR point
1580 STA DX
1590 LDA #0
1600 STA CX
1610
1620 LDA #16
1630 CLC
1640 ADC IX
1650 STA block
1660 LDA #0
1670 ADC IX+1
1680 STA block+1
1690 LDA JX
1700 CLC
1710 ADC #16
1720 STA block+2
1730 LDA JX+1
1740 ADC #0
1750 STA block+3
1760 JSR point
1770
1780 LDA IX
1790 STA block
1800 LDA IX+1
1810 STA block+1
1820 LDA JX
1830 JSR point
1840
1850 LDA IX
1860 SEC
1870 SBC #16

```

```

1880 STA block
1890 LDA IX+1
1900 SBC #0
1910 STA block+1
1920 JSR point
1930
1940 LDA JX
1950 STA block+2
1960 LDA JX+1
1970 STA block+3
1980 JSR point
1990
2000 LDA JX
2010 SEC
2020 SBC #16
2030 STA block+2
2040 LDA JX+1
2050 SBC #0
2060 STA block+3
2070 JSR point
2080
2090 LDA IX
2100 STA block
2110 LDA IX+1
2120 STA block+1
2130 JSR point
2140
2150 LDA IX
2160 CLC
2170 ADC #16
2180 STA block
2190 LDA IX+1
2200 ADC #0
2210 STA block+1
2220 JSR point
2230
2240 LDA JX
2250 STA block+2
2260 LDA JX+1
2270 STA block+3
2280
2290 .point
2300 LDX #block
2310 LDY #0
2320 LDA #9
2330 JSR osword
2340 LDA colour
2350 BEQ here
2360 CMP #&FF
2370 BEQ here
2380 INC CX
2390 .here RTS
2400 J
2410 NEXT
2420 ENDPROC

```

*This listing is included in this month's cassette tape offer. See order form on Page 61.*



**COLOURFUL** and effective 3D lettering is just the thing you need to brighten up your programs. And it's not hard to do. You can create it easily using the VDU 5 statement.

You can have 3D lettering in any mode, but the best effects are in Mode 2. This is because the size of the letters and the range of colours available ensure maximum clarity.

I'll be using Mode 2 in the two example programs, but you can try the other modes if you wish.

When we normally display text in Mode 2 on the Electron it can be printed anywhere on a grid of 20 by 32 characters.

Each line is 20 characters or letters across and there are 32 lines from the top to the bottom of the screen.

Simple maths shows you can have 640 characters on screen at once.

To print ELECTRON USER in the centre of the Mode 2 screen we enter:

```
PRINT TAB(3,16)"ELECTRON
USER"
```

The string ELECTRON USER will now be printed starting at the fourth column of the seventeenth line (if that puzzles you remember that the lines and columns start at 0).

We are not limited to this text grid, however. A graphics grid is also available which allows for much more accurate placing of letters.

This grid, or graphics screen, is made up of 1280 points across and 1024 points up.

The position 0,0 is right down in the bottom left hand corner of the screen.

It's the graphics grid that is used when we tell the Electron to DRAW or PLOT something. Normally we can't use the PRINT command and the graphics grid - we have to use the clumsy text grid.

However there is a command - VDU 5 - that allows you to use PRINT in combi-

## Create colourful 3D lettering with

# VDU5

**MATTHEW HOLROYD shows how**

nation with the graphics grid.

VDU 5 joins the text and graphics cursors. What this means is that after issuing a VDU 5 a PRINT command will display the text at any point on the graphics grid.

As there are 1024 times 1280 points on this grid you can see that you get much finer control over where the text is printed.

As an experiment, still in Mode 2, enter:

```
VDU 5
```

and press Return. Now hold down the Func key and press the letter B.

Notice that although RENUMBER appears on the screen, as you might expect, it does so much more slowly.

This is because once you've issued a VDU 5 text is drawn out on the graphics grid rather than printed as usual. As ever in the world of micros, there's a trade-off. What you gain in fine control you lose in speed. VDU 4 returns things to normal.

Once you've joined the text and graphics cursors you have to position the cursor using the graphics command MOVE.

This means that if we want to print ELECTRON USER in the centre of the screen we now use:

```
MOVE 230,530
PRINT "ELECTRON USER"
```

And now we can start to

print 3D letters. What we do is to print a string on the graphics screen, move the cursor slightly and print the string again. Program I does this.

Line 30 locates the graphics cursor at the point 230,500.

Then line 40 prints the message and line 50 moves the cursor to the new position 234,496.

Line 60 changes the colour being used and line 70 prints the same message in a new colour at a slightly different place. The result is 3D lettering.

To get really good effects you should print the message more than twice, remembering to offset the cursor and change the colour each time.

Program II gives a sample of what can be done. The rest is up to you.

```
10 REM PROGRAM I
20 MODE2:VDU5
30 MOVE230,500
40 PRINT"THE ELECTRON"
50 MOVE234,496
60 GCOL0,1
70 PRINT"THE ELECTRON"
```

*Program I*

```
10 REM PROGRAM II
20 MODE2
30 GCOL0,132:CLG:XX=230:
YZ=900
40 VDU5
50 CX=3:BX=1
60 FORFX=1 TO 16
70 GCOL0,CX
80 MOVEXX,YZ
90 PRINT"ELECTRON USER"
100 XX=XX+4:YZ=YZ-4
110 MOVEXX,YZ
120 PRINT"ELECTRON USER"
130 XX=XX+4:YZ=YZ-4
140 MOVEXX,YZ
150 PRINT"ELECTRON USER"
160 XX=XX+4:YZ=YZ-4
170 MOVEXX,YZ
180 GCOL0,BX
190 PRINT"ELECTRON USER"
200 IF CX=3 THEN CX=0:BX=
6:XX=230:YZ=YZ-36:GOTO220
210 IF CX=0 THEN CX=3:BX=
1:XX=230:YZ=YZ-36
220 NEXTFX
230 VDU23,1,0;0;0;0;
240 GOTO240
```

*Program II*

**THE ELECTRON**

*Output of Program I*

```
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
ELECTRON USER
```

*Output of Program II*







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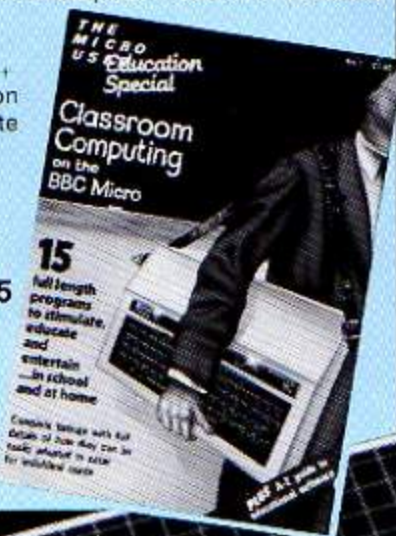
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**Tumult:** Helps with elementary multiplication of two digit numbers — in particular where there are 10s to carry.

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**Matrices:** Takes the calculations out of matrix manipulation, leaving the student free to understand the underlying concepts. (To obtain the fullest benefit from this program see *The Micro User Education Special*.)

**Hidden Answers:** Designed to help primary school children understand a maths learning technique called mapping maths. It explores the ideas of mapping with the use of simple number bonds.

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# Micro Messages

## Eight galaxies up for grabs

A MESSAGE for all players of *Elite*! A way of getting all eight galaxies has been discovered by Commander Dav and Commander Red, a player of the BBC version.

Simply load your commander onto a BBC and use the BBC to hyperspace. Unfortunately this means you need to know a BBC Micro owner who plays *Elite*, but as the Beeb is so good that shouldn't be too hard.

Now a question. I bought 199 kg of platinum at around 60 credits from several systems, and then discovered I can't sell it for its full value.

This means I have made a loss of about 12,000 credits.

The only reason I can think of is 199 kg is a three figure number and I have never seen a three figure number for sale anywhere.

So a warning to other players and a complaint to Acornsoft for not mentioning it in the manual. — **Miles Davies, (Commander Dav, Dangerous), Kidderminster.**

## Joystick routines are needed

I WRITE regarding the article in the February 1985 issue of *Electron User* "Warp drive is go" and *Micro Messages* "Elite warning".

I foolishly purchased this game in January of this year and having read all the instructions tried to play it using joystick control — without any result.

I wrote to Acorn and received a letter stating that the reference to joysticks in the *Electron* version was an error and that this version of *Elite* was not designed to be used with joysticks.

The final paragraph stated "Please do not hesitate to contact me if you require any

further assistance".

I rang Acorn to be told "Hard luck, nothing to do with us, see your software dealer".

Is this the way to gain or keep customers?

I enjoy your magazine, at least you admit it if you make any errors.

Any chance of joystick routines for the Plus 1? — **H.R. Yale, Redhill, Hereford.**

● Have a look at April's Joyplus.

## Missing the market

I AM very disappointed about the lack of big software houses such as Ocean, Activision, Gremlin Graphics, Software Projects, Ultimate, *Elite*, Level 9, US Gold and Micro-Gen producing their latest games for the *Electron*.

The *Electron* has the capabilities to be in the main software market where the CBM64 and Spectrum reign. I'm sure there is a big market for these companies in this area.

Let's see lots of games being produced by other companies rather than just

Acornsoft and Micro Power.

I expect you're probably saying, "Should have bought a Commodore, shouldn't you?" My answer to that is that I learn BBC Basic at school, so with the *Electron* I can come home and advance my programming further.

I enjoy programming and playing games. I know the companies mentioned produce great games for the other computers, so why not the *Electron*? — **Matthew Smith, Barking, Essex.**



CAN you help me with Alan Griffiths' *Racer* program from the February 1985 *Electron User*? I've typed it in, but all I get when I run it is the high score table?

Is it you or is it me? — **Tony Riley, Glamorgan.**

● It's you Tony. What's hap-

pened is that you've made a typing error when you entered the listing.

This has been picked up by the ON ERROR of line 50 and the program goes to line 120 and PROCscore.

To find out where your error lies just leave out line 50 until you've debugged the program completely.

The *Electron* will now point out your mistake.

## Electronic attraction

ONE of the attractions of the *Electron* was the use of BBC Basic.

I use a BBC at work and had planned to develop programs at home to be used at work.

This has worked out well in practice, but one problem has arisen.

Programs saved onto tape by the BBC will not load into the *Electron*.

Is there a reason for this and more importantly is there a solution? — **S. Harper, Wantage, Oxon.**

● We think it must be the

## Confused by a variable

MANY thanks for Roland Waddilove's excellent screen dump program in the March 1985 issue.

I've had some very good results with my Brother printer but there's one program that I can't dump.

Whenever I try to use the machine code dump on Jon Willington's *Pie Chart* program (January 1985) all I get is

"Bad string". Can you help? — **Ian Whitehead, Walkley, Sheffield.**

● The problem occurs when you try to use the machine code program with a line like:

CALL DX

In the normal course of things the integer variable D% holds the address where the machine code dump is stored.

The trouble is that the *Pie Chart* program also uses D%, setting it to -50. When the CALL occurs the poor old *Electron* is confused and hence the puzzled message. After all, where is memory location -50? All you have to do to overcome this is to use:

CALL 1900

to activate the dump.



## From Page 49

cassette recorder you use. Certainly we have never had any problems loading programs saved from a BBC Micro into an Electron.

Check your recording levels and make sure the BBC is operating at 1200 Baud, the same rate as the Electron.

## On the offensive

I OWN an Acorn Electron and I am very pleased with it, the Basic is so simple.

As my friend has a Spectrum I was reading a Sinclair User and in the crossword the clue for 7 across was: "A computer made from scrap metal" and Acorn fitted perfectly.

I was very annoyed with it and lately I am being teased by Commodore 64 owners who say that Electrons are, well words I cannot mention in a letter.

Please could you print something to offend Commodore and Sinclair users? — **Michael Hoar, Duffield, Derbys.**

● If we wanted to offend them; all we'd have to do is to publish their machine's specification. However, we're too considerate.

## Clue to the missing Plus 2?

IN Micro Messages in the March 1985 issue of Electron User there was some excitement about whether the Plus 2 is the Tube or the Econet.

Perhaps this will be of interest. In the header of Acornsoft Hopper, line 60 reads: "IF USR (&FFF4) AND &FF00 THEN PRINT "please turn your tube off and try again".

Is this the mysterious Plus 2? — **J.C. McDermott, Cottingham, North Humberside.**

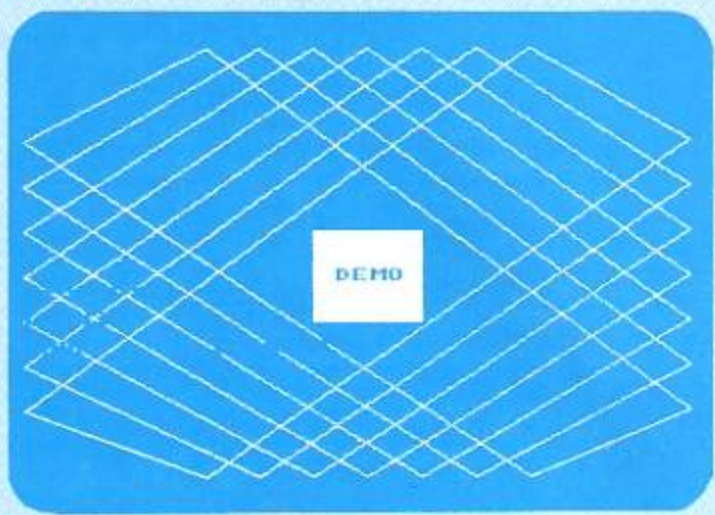
● Acorn are still silent about the Plus 2. In view of the recent reorganisation it's very much a wait and see situation.

# Screen dump for the Shinwa CP80

HAVING seen Roland Waddi-  
love's screen dump in the  
March issue of Electron User I  
decided to cobble one  
together for my Shinwa CP80  
printer. As you can see from  
Program I, it's a cross between  
Basic and machine code.

Program II, which assumes  
you've got Program I on tape  
and called it XDUMP, shows  
what it can do. — **W.E.  
Trevelyan, Epsom Downs,  
Surrey.**

● Many thanks for your  
hybrid program Dr Trevelyan.  
Have any of our other readers  
adapted the dumps for their  
own printers?



Sample output from XDUMP

### Program I

```
10 REM Program XDUMP
20 REM hybrid Basic-M/C
dump
30 REM for Mode 1,2,4,or
5
40 :
50 PROCassemble
60 PROCdump
70 END
80 :
90 DEFPROCdump
100 VDU26
110 #FX6,12
120 #KEY10 OLDIM LISTIM
130 VDU2
140 VDU1,27,1,ASC"A",1,8
150 VDU1,27,1,ASC"D",1,20
,1,8
160 FOR yX=1020 TO 30 STE
P -32
170 ?&80=yX MOD 256
180 ?&81=yX DIV 256
190 VDU1,9
200 VDU1,27,1,ASC"K",1,64
,1,1
210 FOR :X=2 TO 1278 STEP
4
220 ?&70=xX MOD 256
230 ?&71=xX DIV 256
240 CALL start
250 NEXT xX
260 VDU1,13,1,10
270 NEXT yX
280 VDU1,27,1,ASC"0",1,7
290 VDU3
300 ENDPROC
310 :
```

```
320 DEFPROCassemble
330 osword=&FFF1:oswrch=&
FFEE
340 Xlo=&70:Xhi=&71:Ylo=&
72:Yhi=&73
350 tint=&74:octet=&75:co
unt=&76
360 !tint=&00000000
370 YYlo=&80:YYhi=&81
380 DIM code 70
390 FOR pass=0 TO 2 STEP
2
400 PX=code
410 [OPT pass
420 .start LDA #8
430 STA count
440 LDA YYlo
450 STA Ylo
460 LDA YYhi
470 STA Yhi
480 .test LDX #&70
490 LDY #0
500 LDA #9
510 JSR osword
```

```
520 .byte LDA tint
530 AND #1
540 ASL octet
550 CLC
560 ADC octet
570 STA octet
580 .loop DEC count
590 BEQ print
600 LDA Ylo
610 SEC
620 SBC #4
630 STA Ylo
640 LDA Yhi
650 SBC #0
660 STA Yhi
670 JNP test
680 .print LDA #1
690 JSR oswrch
700 LDA octet
710 JSR oswrch
720 RTS
730 ]
740 NEXT pass
750 ENDPROC
```

### Program II

```
10 REM Program DEMO
20 REM To test screen du
mp
30 :
50 MODE 4
60 :
100 FOR N=-3 TO 3
110 MOVE 0,512-100*N:DRAW
640+100*N,1023
120 DRAW 1239,512+100*N:D
```

```
RAW 640-100*N,64
130 DRAW 0,512-100*N
140 NEXT
150 MOVE 740,612:MOVE 540
,612
160 PLOT85,740,412:PLOT85
,540,412
170 VDU5:GCOLOR,0
180 MOVE 580,528:PRINT"DE
MO"
190 #OPT1,0
200 PAGE=PAGE+&1000
210 CHAIN "XDUMP"
```



# ROM switching eases loading

SEVERAL points arise from reading the letters pages of your recent issues.

Firstly the loading problems mentioned by Roland Wadilove (January issue). As Roland correctly says, the Plus1, among others, slows down the Electron's action and makes loading very critical in Modes 0 to 3.

The real answer is a routine which will enable you to switch the ROM in and out during a program. The attached listing intercepts the WRCHVEC and detects the user pressing Ctrl-@ (off) or Ctrl-A (on).

As other ROMs may also affect speed, this routine disables all ROMs, except Basic, and keeps a copy of their "type number", so that re-enabling returns the machine to its previous state.

It will work with all programs which are capable of being "frozen". Once assembled, the code should be \*SAVED and \*RUN before loading your game. If Break is pressed the code may be re-activated by CALL &A00.

Miss Hillage mentions BBC programs which will run on the Electron. The following Acornsoft packs work, although some of them have distorted title screens: Graphs & Charts, Creative Graphics, Word Sequencing, Word Hunt, Lisp, Sliding Block Puzzles, Chess, Missing Signs, Turtle Graphics, Desk Diary, Snooker, Forth, Microtext, Picture maker, Cube Master.

BBC Soft's White Knight (MK. II) and Word Mover also work and, in the business field, the Stock Control, Payroll, Purchase/Sales Ledger and Mailing List packs from Abacus will run with minor modifications.

As to ROM firmware, View, Exmon, BCPL and the Graphics ROM all work fine, although the Graphics ROM can cause loading problems and should be removed altogether for commercial games.

Modesty forbids me from mentioning the other software house, whose programs are all

compatible!

In the same issue Mr Wilson's solution to the on/off switch is fine, but may I warn your readers against fitting a switch either in the case or in the lead from the adapter to the machine.

The reason is that, by implication, this will mean that the mains adapter is left connected to the mains supply, and this is dangerous.

In fact, the transformer in the mains adapter has a thermal cutout which may trip if the adapter is left active for a long time and, once tripped, it cannot be reset, which means buying a new adapter.

The Plus 3, which contains its own power supply, should solve this problem.

Now to Mr Platt and his ESC code problem. The way to send escape codes to the printer is by using VDU1,27 (27 being the Ascii code for escapement).

For example, my printer uses ESC "Q" for bold printing. To activate this I would precede the text with VDU1,27,1,81.

With word processors some allow embedded control codes, for example Wordwise uses the OC prefix, while others, like View, really need a special program called a printer driver.

In the February issue Mr Clewson notes the drawbacks of switched joysticks, and I feel that your readers, especially the younger ones, should be made aware that while most arcade games are written for switched joysticks,

```

5 REM DISABLE/ENABLE RO
MS
6 REM BARRY PICKLES
7 REM SOFTWARE CLASSICS
10 FOR optX=0 TO 3 STEP 3
20 PZ=&A00
30 [
40 OPT optX
50 .init
60 LDA &20E
70 STA oldvec
80 LDA &20F
90 STA oldvec+1
100 LDA #(entry AND &FF)
110 STA &20E
120 LDA #(entry DIV &FF)
130 STA &20F
140 .entry
150 CMP #0
160 BEQ off
170 CMP #1
180 BEQ on
190 JMP (oldvec)
200 .off
210 LDX #16
220 .loop1
230 LDA &29F,X

240 STA &A6F,X
250 LDA #0
260 STA &29F,X
270 DEX
280 BNE loop1
290 JMP (oldvec)
300 .on
310 LDX #16
320 .loop2
330 LDA &A6F,X
340 STA &29F,X
350 DEX
360 BNE loop2
370 JMP (oldvec)
380 .oldvec
390 EQUW &0000
400 ]
410 NEXT
420 PRINT "To save code:"
430 PRINT "SAVE "ROMOFF
440 PRINT "To reload:"
450 PRINT "RUN "ROMOFF
460 CALL &A00
470 END

```

Reader Barry Pickles ROM-switching program

it is a fact that this type cannot be made to function as an analogue joystick.

The analogue type can, by fairly simple programming, be made to function like a switched joystick. Given a choice, I would go for the, more versatile, analogue type any day. — Barry Pickles, Software Classics.

● Many thanks Barry. It's nice to see that you old Acorn Atom freaks are getting interested in the Electron.

## Ghoul tip

FOR anyone who owns a copy of Ghouls I have discovered a

code to give you infinite lives. Firstly press Break to reset the computer, then enter:

PAGE=&2200

LOAD "GHOULS1"

The section Ghouls1 will load up to 26 26B0. Once it is loaded enter:

LIST 35

Change the part of the line L1=4 to L1=99999, copy the rest of the line and press Return.

Now type:

LIST 60

Change the line to:

60 FOR F=0 TO 32 STEP 16:  
FOR...etc

and copy the rest of the line and press Return.

Now enter:

LIST 2055

and change line 2055 to:

2055 NEXT

RUN the tape, which will load the part "???" to 18 18FF, and that's it. Happy Ghouling! — Dean Wilson, Havant, Hants.

**WHAT would you like to see in future issues of Electron User?**

**What tips have you picked up that could help other readers?**

**Now's here is your opportunity to share your experiences.**

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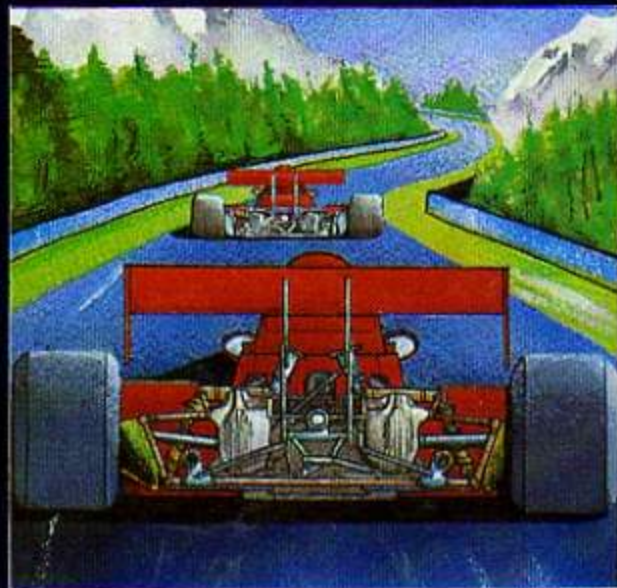
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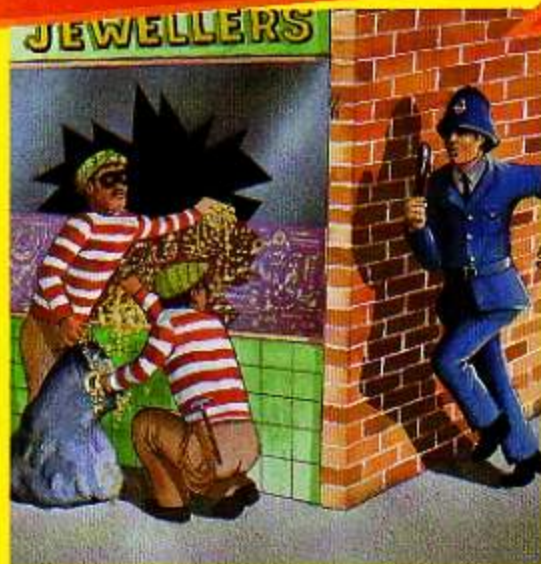


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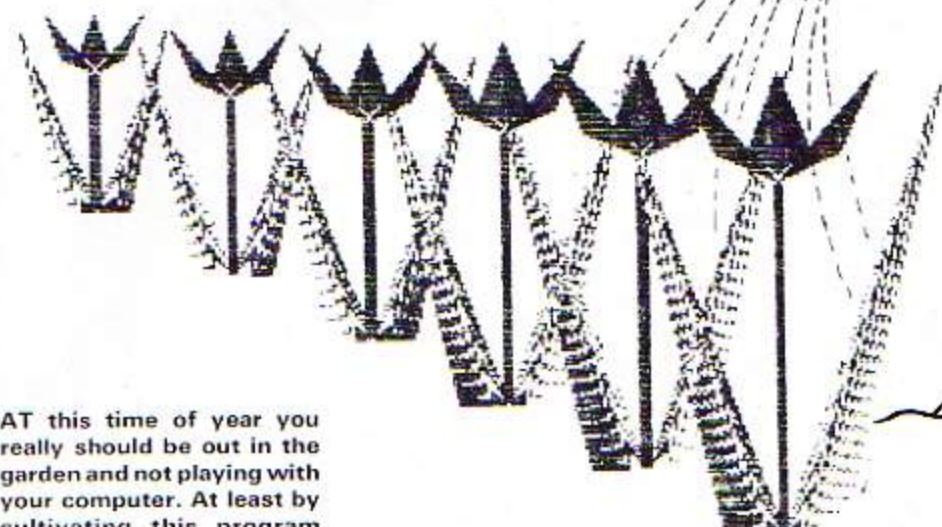
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# SPRING FLOWERS

A blooming good graphics program  
... grown for you by ROGER FROST



AT this time of year you really should be out in the garden and not playing with your computer. At least by cultivating this program you can let your Electron grow some flowers for you.

It's just like the real thing, because you never know what colour blooms will come up.

Resident integer variables have been used in this program to make the flowers grow faster.

The seeds have been planted at position A%, B% and watered with growth promoters X%, Y% and Z%.

The feathered leaves have been obtained by a judicious

application of GCOL3, while GCOL0 was used to give the sturdy stems.

The colours were obtained by preparing the ground with RND and VDU19.

These flowers are ideal for picking. Pressing Space removes the lot and they re-grow in new colours.

From time to time a night time view will be seen, but mostly your flowers will bloom in bright daylight.



```
10 REM SPRING FLOWERS
20 REM By Rog Frost
30 REM (C) ELECTRON USER
40 MODE1
50 REPEAT
60 VDU23;0202;0;0;0;
70 AX=-50:BX=660
80 EX=RND(4)
90 IF EX=1 VDU20 ELSE VD
U19,0,7;0;
100 VDU19,3,2,0,0,0
110 FX=RND(6):IF FX=2 THE
N110
120 GX=RND(6):IF GX=2 OR
GX=FX THEN120
```

```
130 VDU19,1,FX;0;19,2,GX;
0;
140 FOR flower=1TO6
150 AX=AX+170:BX=BX-100
160 VDU29,AX;BX;
170 VDU19,3,2,0,0,0
180 GCOL3,3
190 XX=20:YY=0:ZZ=0
200 REPEAT
210 PROCplant(XX,YY,ZZ)
220 XX=XX+5:YY=YY+20:ZZ=Z
X+2
230 UNTILXX+YY>900-BX-XX
240 PROCflower
250 NEXT
```

```
260 REPEATUNTILGET=32:CLG
270 UNTIL0
280 DEFPROCplant(XX,YY,ZZ
290 MOVE0,0:MOVE-(20+ZZ),
0:PLOT85,-(XX+ZZ),XX+YY
300 MOVE0,0:MOVE20+ZZ,0:P
LOT85,XX+ZZ,XX+YY
310 GCOL0,3
320 MOVE-5,5:MOVE-5,YY+5
PLOT85,5,5:PLOT85,5,YY+5
330 GCOL3,3
340 ENDPROC
350 DEFPROCflower
360 GCOL0,RND(2)
```

```
370 MOVE0,YY-10:MOVE-XX/2
,XX/4+YY-10:PLOT85,-XX+.8,XX+YY
380 MOVE0,YY-10:MOVEXX/2,
XX/4+YY-10:PLOT85,XX+.8,XX+
YY
390 MOVE0,YY:MOVE-XX/4,XX
/4+YY:PLOT85,XX/4,XX/4+YY:P
LOT85,0,XX+YY
400 ENDPROC
```

This listing is included in this month's cassette tape offer. See order form on Page 61.



# Notebook Part 16

## EXPANDING QUADRILATERALS

THIS month we take a look at a simple animation technique. When you run the program, you'll see a square that appears to be moving towards you.

In fact there's nothing moving at all, it's all done by palette switching, as the explanation shows. The eye is fooled into thinking a static display is dynamic.

When you've understood how it works, why not try to have the square moving away from you?

### Program explanation

10-30 Name the program and its author and put the Electron into Mode 2, the 16 colour mode.

40,50 Assign initial values to the coordinates of the squares. Try changing these and see what happens.

60-120 Form a FOR...NEXT loop which cycles 15 times, each time drawing a slightly larger square, each square in a different colour. Calculate the coordinates for each square. Notice that each coordinate is offset from the initial coordinates by a factor of 25 times the value of colour. This means that each successive square is larger. If you're feeling experimental, try other values than 25.

110 Calls the procedure that actually draws the squares. Each time it's called the parameters passed to it (calculated above) ensure that the resulting square is drawn in a different position and in a different colour.

130-150 Make up another FOR...NEXT loop. This also cycles 15 times and each time round the loop the VDU 19 of line 140 turns the colour number loop to black. Since this is the background colour it effectively makes each square in turn disappear. You have a black screen with 15 black squares drawn on it.

170-230 Form an endless loop.

180-220 This FOR...NEXT loop produces the animation effect by changing successive squares from black to white and then, after a short delay, back to black again. As it cycles 15 times, each square is dealt with in turn. The VDU 19 turns colour number switch to colour number 7. This means that the square drawn in colour switch will appear in white. Reverses the effect, turning the square back to black after a slight delay. Have a go at varying the delay (PROCdelay) and see what happens.

240-310 Make up the procedure which draws the squares using parameters passed from the main program.

250 Picks the colour that is used to draw the square. In all, 15 of the 16 available colours in Mode 2 are used.

10 REM EXPANDING QUADRIL  
ATERS

20 REM TREVOR ROBERTS

30 MODE 2

35 VDU 23,1,0;0;0;0;

40 startx1=650:startx2=7

80

50 starty1=475:starty2=5

25

60 FOR colour=1 TO 15

70 leftx=startx1-colour\*

25

80 rightx=startx2+colour

\*25

90 bottomy=starty1-colou

r\*25

100 topy=starty2+colour\*2

5

110 PROCsquare(leftx,bott  
omy,rightx,topy,colour)

120 NEXT colour

130 FOR loop=1 TO 15

140 VDU 19,loop,0,0,0,0

150 NEXT loop

160 PROCdelay

170 REPEAT

180 FOR switch=1 TO 15

190 VDU 19,switch,7,0,0,0

200 PROCdelay

210 VDU 19,switch,0,0,0,0

220 NEXT switch

230 UNTIL FALSE

240 DEF PROCsquare(x1,y1,  
x2,y2,col)

250 GCOL 0,col

260 MOVE x1,y1

270 DRAW x2,y1

280 DRAW x2,y2

290 DRAW x1,y2

300 DRAW x1,y1

310 ENDPROC

320 DEF PROCdelay

330 FOR delay=1 TO 300

340 NEXT delay

350 ENDPROC

Initial  
coordinates

Calculates  
coordinates  
of each  
successive  
square

Calls the  
procedure  
using the new  
parameters

All colours  
turned to  
black  
Goodbye square!

Changes square  
to white  
Short delay  
Changes square  
to black

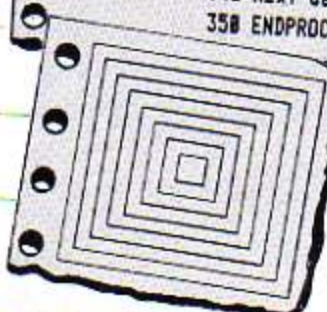
Sets colours

delay loop

Draw 15  
squares,  
each in a  
different  
place and  
colour

Animation  
loop  
switches  
colours

Draws a  
square in  
colour col



Trevor Roberts





I HAVE a lot of problems to answer this month – which is not necessarily the same as having the answers to a lot of problems.

Firstly though, could I ask you to send me a map when you write in and, if possible, also tell me what problems you have solved and list the objects you have found.

Sometimes we get an adventure in order to try to answer a reader's problem and it helps if I not only know where you are stuck but also how you got there.

Incidentally, please don't write in offering to give hints. It is more in the spirit of adventuring to write in WITH hints! Which reminds me, let me say thank you to those of you who have written in already. The response has been fantastic.

Some hot news from Epic is that they are soon to release a

new adventure. I am told that it will be even better than Wheel of Fortune. Could this be THE adventure of 1985?

Incidentally, Epic tell me that efforts are being concentrated on the Electron now, so we can look forward to even more excellent adventures in the future.

Frustratingly, two problems have arisen with which I cannot help.

Andrew Dickman is having trouble with Program Power's Adventure. He wants to know how to get past the killer rat and what is the password right at the beginning.

I don't understand how he

has managed to get to the killer rat without knowing the password, but at any rate I can't help.

Can any intrepid adventurers out there give aid?

Also, J.S. King is stuck in the repository in Classic Adventure. Is this the end-game and he can't get out because he hasn't got all the treasure?

#### Problem Corner

Beverley McJannett, Jeffrey Cole, Lyndsey Pyatt and Glynn Webb are all having problems with Sphinx Adventure.

To get past the elephant,

get the mouse from the vampire's castle. You will find this on the other side of the maze of coloured rooms and junctions. (Hint: There are two red rooms.)

To get out of the serpent, strike a light. The matches are in the Eastern Palace (?). Go past orc, glacier and catacombs.

To get past the ogre, use the sword. To enter the safe you will need the magic word. Go over the troll's bridge and past the ogre.

Incidentally, any treasure that you PAY the troll will turn up, so don't worry. Can't find the boat? Look in the vampire's castle.

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**MR. FREEZE** Ice cube arcade action. **SCREENDUMP** Two procedures for printer dumps. **FILLER** The machine code fill routine. **FRED'S WORD GAME** Educational fun. **BIG LETTERS** Large text utility. **PERCY** Beat the running fuse. **ANIMATION** Two example programs. **PIGS** Flying upon. **NOTEBOOK** Display formatting.

**On the February 1985 tape:**  
**CRAAL** The modifying maze adventure. **BOUNCY** Addictively annoying action. **PAIRS** Can you remember the cards? **BASE A** Basey, he xadecimal conversion utility. **CATCHER** Collect the eggs before they break. **CLOCK** Time-keeping utility. **RACER** Grand Prix action. **NOTEBOOK** Graphics windows. **TRIG** All the right angles.

**On the January 1985 tape:**  
**SPACE BATTLE** Destroy the deadly descending aliens! **NEW YEAR** A sound and graphics greeting. **ESCAPE FROM SCARGOV** Minefield action. **PIE CHART** Statistics made simple. **CLAYPIGEON** An Electron birdshot. **ORGAN** Music maestro please! **NOTEBOOK** An original program. **RANDOM NUMBERS** Or not so random! **SNAKES** Reptilian arcade action. **CHEESE RACE** Beer rival race.

**On the December 1984 tape:**  
**CHRISTMAS BOX** Align the presents logically. **SILLY SANTA** Sort out the muddle. **SNAP** Match the Xmas pictures. **RECOVERY** The Bad Program message tamed. **CAROL** Interrupt driven music. **AUTODATA** A program that grows and grows. **NOTEBOOK** Simple string handling.

**On the November 1984 tape:**  
**STAR FIGHTER** Anti-aliased missions. **SCROLLER** Wrap around machine code. **URBAN SPRAWL** Environmental action game. **SPELL** Alphabetic education. **JUMPER** Level headed action. **CAESAR** Code breaking broken. **KEYBOARD** Typing game.

**On the October 1984 tape:**  
**BREKFREE** Classic arcade action. **ALPHASWAP** A logic game to strain your brain. **SOUND GENERATOR** Tame the Electron's sound channels. **MULTICHARACTER GENERATOR** Complex characters made simple. **RIGEL 5** Out of this world graphics. **MAYDAY** Help with your mouse code. **NOTEBOOK** Palindromes and string handling.

**On the September 1984 tape:**  
**HAUNTED HOUSE** Arcade action in the spirit world. **SPLASH** A logic game for non-swimmers. **SHORT SHOWS** How sorting algorithms work. **SHORT TIME** The time they take. **CLASSROOM INVADERS** Multicoloured characters go to school. **SAILOR** Nautical antics. **MATHS TEST** Try out your mental powers.

**On the August 1984 tape:**  
**SANDCASTLE** The Electron seaside outing. **KNOCKOUT** Bouncing balls batter brick walls. **PARACHUTE** Keep the skydivers dry. **LETTERS** Large letters for your screen. **SUPER-SPELL** Test your spelling. **ON YOUR BIKE** Pedal power comes to your Electron. **SCROLLER** Sliced strings slide sideways. **FLYING PIGS** Bacon on the wing.

**On the July 1984 tape:**  
**GOLF** A day on the links with your Electron. **SOLITAIRE** The classic card logic game. **TALL LETTERS** Large characters made simple. **BANK ACCOUNT** Keep track of your money. **CHARTIST** 3D graphs. **FORMULAE** Areas, volumes and angles.

**On the June 1984 tape:**  
**MONEY MAZE** Avoid the ghosts to get the cash. **CODE BREAKER** A mastermind is needed to crack the code. **ALIEN** See little green men in the Electron way! **SETUP** Colour commands without tears. **CRYSTALS** Beautiful graphics. **LASER SHOOT-OUT** An intergalactic shooting gallery. **SMILER** Have a nice day!

**On the May 1984 tape:**  
**RALLY DRIVER** High speed car control. **SPACE PODS** More aliens to annihilate. **CODER** Secret messages made simple. **FRUIT MACHINE** Spin the wheels to win. **CHASER** Avoid your opponent to survive. **TIC-TAC-TOE** Electron noughts and crosses. **ELECTRON DRAUGHTSMAN** Create and save Electron masterpieces.

**On the April 1984 tape:**  
**SPACEHIKE** A hopping arcade classic. **FRIEZE** Electron wallpaper. **PELICAN** Cross roads safely. **CHESTIMER** Clock your moves. **ASTERIOD** Space is a minefield. **LIMERICK** Autopneumatic rhymes. **ROMAN** Numbers in the ancient way. **BUNNYBLITZ** The Easter program. **DOGGUICK** The classic logic game.

**On the March 1984 tape:**  
**CHICKEN** Let dangerous drivers test your nerve. **COFFEE** A tantalising word game from Down Under. **PARKY'S PERIL** Parky's lost in an invisible maze. **REACTION TIMER** How fast are you? **BRAINTEASER** A puzzling program. **COUNTER** Mental arithmetic can be fun. **PAPER, SCISSORS, STONE** Out-guess your Electron. **CHARACTER GENERATOR** Create shapes with this utility.

**On the February 1984 tape:**  
**NUMBER BALANCE** Test your powers of mental arithmetic. **CALCULATOR** Make your Electron a calculator. **DOILES** Multi-coloured patterns galore. **TOWERS OF HANOI** The age old puzzle. **LUNAR LANDER** Test your skill as an astronaut. **POSITRON INVADERS** A version of the old arcade favourite.

**On the introductory tape:**  
**ANAGRAM** Sort out the jumbled letters. **DOODLE** Multicoloured graphics. **EUROMAP** Test your geography. **KALEIDOSCOPE** Electron graphics run riot. **CAPITALS** New upper case letters. **ROCKET, WHEEL, CANDLE** Three fireworks programs. **BOMBER** Drop the bombs before you crash. **DUCK** Simple animation. **METEORS** Collisions in space.



Use the order form on Page 61



# BOOK SHELF

*Exploring Adventures on the Electron by Peter Gerrard (Duckworth)*

**PETER Gerrard has produced a book that fulfils several needs at once.**

This is not only a book on how to write adventures. It is also a guide to their history and how to solve them.

The opening chapters explain how they came into being and then go on to give you tips on solving various puzzles that you may come across.

Although most of the games mentioned here are not available for the Electron, it still makes good reading.

Peter Gerrard then goes on to show you how to write adventures. The Basic commands used are explained and short programs given to demonstrate how they work.

The commands explained in this section are only those that the author himself uses in his own adventures. Thus INSTRS gets no mention.

I would have also liked to have seen examples explaining how to program arrays in more than one dimension. In fact, I think data handling in general could have been better explained and demonstrated.

However this section is still a lot more comprehensive and understandable than the comparable sections in the user guide!

The last part of the book contains listings of three adventures. The first, Underground Adventure, is very comprehensively documented.

The whole program is split into the routines used in the game and then explained line by line.

While I think that this is a superb and innovative idea, the ON...GOTO and GOSUBs that these routines contain (usually to lines not shown in the routines) can be extremely hard to find.

Finally you are given two complete listings to type in.

All three adventures are available separately on a single cassette. I would

## Find your way round adventures

recommend that you buy the cassette, tackle the adventures and then read the book!

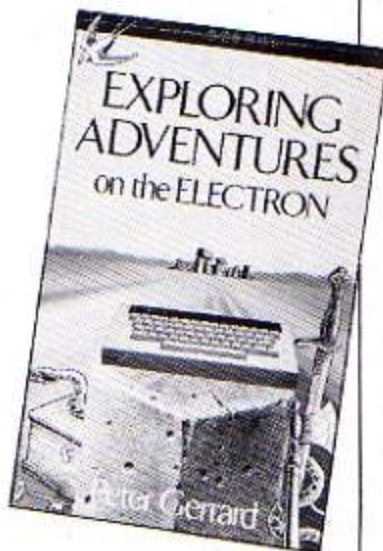
It is a lot easier to understand the routines if you can get a printout of the listings.

I would have liked to see a mini-adventure in the book. Learning how to write adventures isn't easy, and the beginner could find the size of these ones somewhat daunting.

However don't let my criticisms put you off. I think this is an extremely good buy.

Although it could have been made easier for the beginner, it must be, with its section on how to program all the routines necessary in an adventure, almost a programmer's reference book.

The three adventures are also very good and, despite



having a full listing in the book, baffling to play.

This book is a delight to read and use and a welcome addition to any adventure programmer's bookshelf.

**Merlin**



**THIS book has eight chapters, of which the first and last concern programming techniques and each of the middle six deal with the production of one game.**

The authors' aim is to enable Electron users to write their own long programs. Their method is to describe in great detail how they have constructed their games programs.

The main technique is to use the procedure facility in Electron Basic. This, of course, enables you to break the program down into sensible small chunks, which have just one job within the program.

In each chapter the procedures are introduced one at a time and every line is well explained.

While most procedures are

*The Electron Gamesmaster by Kay Ewbank, Mike James and S.M. Gee (Granada)*

written in Basic, some are translated into assembler. Where this is used the reasons and mechanics of it are dealt with thoroughly.

The end of each chapter consists of a full listing for the game.

The games I have had typed in by pupils at my school (thanks Keith!) were clearly written and without bugs. They operate very smoothly and are fun to play.

I would criticise their use of spaces, however, I prefer not to leave spaces after line numbers. On a long program like Tadpole, these spaces can amount to close on half a

kilobyte of memory. They also slow the program down.

My other criticism is that line numbers are not in regular tens. This makes AUTO difficult.

I dislike the use of cursor keys as games controls. I wonder if the authors chose these to encourage people to change them. That could also explain the ghastly choice of colours for some games.

This apart, I would strongly recommend this book to anyone who wants to learn to produce large programs.

Work through this book and you will have gained much knowledge of program structure and assembly language animation as well as half a dozen good quality games. It is very good value.

**Rog Frost**

## Taking games programming in small chunks



# Cedric

and his  
lost toys

**POOR** old Cedric has lost his toys. Can you help him find them?

They are all hidden in boxes which are labelled 1 to 8 across and A to E down. There are 20 pairs of these toys to find.

When you run the program you'll both be asked to type in your names. Then you must take turns to try to find a matching pair.

Type in the coordinates of the two squares you want to look at (number first). If the two toys that are revealed are identical, the computer increases your score by one and lets you have another turn.

If they're not identical, the toys disappear and the next player has a turn.

The winner is the one who finds the most toys at the end of the game.

## MAJOR VARIABLES

|                        |                                    |
|------------------------|------------------------------------|
| <b>name1\$,name2\$</b> | Names of the players.              |
| <b>s1%,s2%</b>         | Scores of the two players.         |
| <b>j%</b>              | Number of pairs of toys found.     |
| <b>z%</b>              | Used as a flag.                    |
| <b>a\$(x)</b>          | Graphics for toys.                 |
| <b>ob%(x,y)</b>        | Arrays to hold toys.               |
| <b>a,b</b>             | Random numbers to hide toys.       |
| <b>x,y</b>             | Coordinates for graphics.          |
| <b>t\$,s\$,t,s</b>     | Input squares.                     |
| <b>fa%</b>             | Check for match.                   |
| <b>qa,qb,pa,pb</b>     | Coordinates of the toys displayed. |

## PROCEDURES

|                        |   |
|------------------------|---|
| <b>PROCguess</b>       | Input coordinates.                                |
| <b>PROCsound</b>       | Plays tune.                                       |
| <b>PROCcheck</b>       | Checks contents of array and selects coordinates. |
| <b>PROCIstructions</b> | Gives instructions.                               |
| <b>PROCscore</b>       | Sets scores.                                      |
| <b>PROCdisplay</b>     | Displays graphics for titles.                     |

By  
**STEVE LUCAS**

```

10 REM ** Cedric's lost
toys **
20 REM ** (C) ELECTRON U
SER
30 REM ** Steve W. Lucas
40 JX=0:PIZ=0:SI=0:S2X=
0
50 MODE 1:OIM a$(20)
60 VDU 19,0,7,0,0,0,19,1
,4,0,0,0,19,2,1,0,0,0,19,3,
0,0,0,0
70 VDU 23,1,0,0,0,0,0,
80 VDU 23,224,0,0,152,24
8,152,24,0,0
90 VDU 23,225,0,0,24,191
,253,63,60,0
100 VDU 23,226,32,127,95,
127,127,91,219,27
110 VDU 23,227,15,63,255,
25,31,25,31,31
120 VDU 23,228,240,252,25
5,216,240,248,216,216
130 VDU 23,229,0,96,112,0
8,204,252,0,192
140 VDU 23,230,103,159,89
,185,95,187,44,71
150 VDU 23,231,230,249,15
4,157,250,221,52,226
160 VDU 23,232,192,128,15
6,191,255,255,65,113
170 VDU 23,233,14,31,55,1
27,63,3,14,0
180 VDU 23,234,35,226,162
,254,190,62,18,54
190 VDU 23,235,16,56,16,1
24,16,254,16,56
200 VDU 23,236,0,0,15,11,
15,255,127,63
210 VDU 23,237,128,128,24
0,240,240,255,255,255
220 VDU 23,238,0,254,222,
142,222,254,254,12
230 VDU 23,239,0,15,9,9,1
27,127,127,48
240 VDU 23,240,0,0,255,25
3,253,220,20,60
250 VDU 23,241,136,112,12
7,127,127,14,10,30
260 VDU 23,242,192,224,22
4,224,248,204,14,174
270 VDU 23,243,1,3,3,3,15
,25,56,50
280 VDU 23,244,0,0,63,61,
63,60,255,126
290 VDU 23,245,28,28,0,12
7,8,20,34,65
300 VDU 23,246,0,160,224,
160,235,255,53,63
310 VDU 23,247,0,2,3,2,12
7,255,170,254
320 VDU 23,248,60,126,219
,231,255,146,146,219
330 VDU 23,249,36,24,27,2
54,190,36,102,0
340 VDU 23,250,0,0,192,48
,252,255,24,24
350 VDU 23,251,0,0,15,24,
127,225,24,24
360 VDU 23,252,0,0,0,0,23
2,252,0,8
370 VDU 23,253,0,128,143,
241,255,127,3,2
380 VDU 23,254,128,224,0,
0,255,254,252,248
390 VDU 23,255,1,1,1,1,25
5,127,63,31
400 a$(1)=CHR$(249):a$(12)
=CHR$(235):a$(3)=CHR$(244)
410 a$(15)=CHR$(248)
420 a$(16)=CHR$(225):a$(17)
=CHR$(227)+CHR$(228)
430 a$(18)=CHR$(233)+CHR$(
224):a$(19)=CHR$(230)+CHR$(2
31):a$(10)=CHR$(232)+CHR$(2
29)
440 a$(11)=CHR$(234):a$(1
2)=CHR$(236)+CHR$(237)

```



```

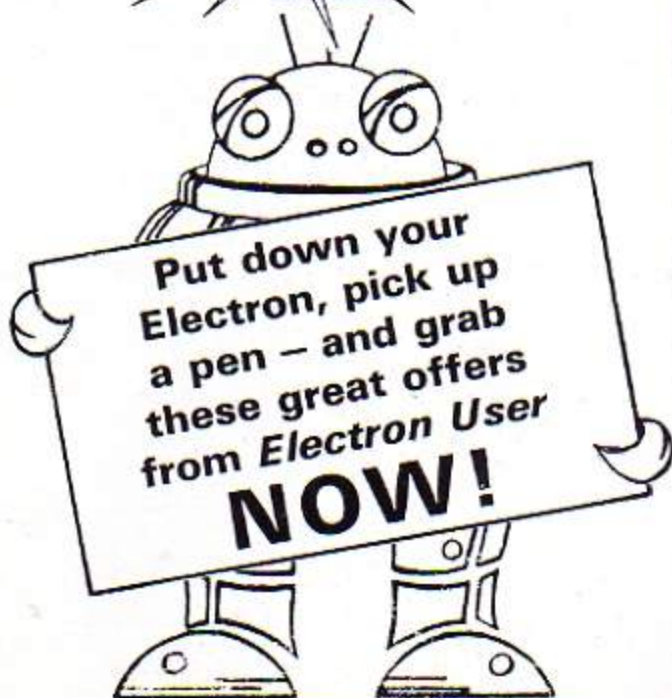
450 a$(113)=CHR$(239)+CHR$(238):a$(114)=CHR$(241)+CHR$(240)
460 a$(115)=CHR$(247)+CHR$(246):a$(116)=CHR$(226):a$(117)=CHR$(243)+CHR$(242)
470 a$(118)=CHR$(245):a$(119)=CHR$(251)+CHR$(250)
480 a$(120)=CHR$(253)+CHR$(252):a$(121)=CHR$(255)+CHR$(254)
490 PROCInstructions
500 DIM ob%(10,10)
510 z%=1:REM lower case z
520 FOR Y=1 TO 8: FOR X=1 TO 5
530 a=RND(5):b=RND(10)
540 IF ob%(a,b)<>0 THEN S=0
550 ob%(a,b)=z%:z%=z%+1:IF z%>20 THEN z%=1
560 NEXT X,Y
570 VDU 28,0,31,39,0
580 COLOUR 3:FX 15,0
590 PRINT TAB(0,31):"Press the <Space Bar> to start the game:"
600 REPEAT UNTIL GET=32
610 CLS:COLOUR 1:INPUT "Player 1 please enter your name " :name1$:VDU 7
620 COLOUR 2:INPUT "Player 2 please enter your name " :name2$:VDU 7:CLS
630 FOR X=0 TO 8
640 MOVE X*120+100,256:DRAW X*120+100,1024
650 NEXT X
660 MOVE 100,1021:DRAW 1200,1021
670 MOVE 100,922:DRAW 1200,922
680 VDU 5
690 FOR Y=0 TO 4
700 MOVE 100,Y*133+256:DRAW 1200,Y*133+256
710 MOVE 1140,Y*133+333:PRINTCHR$(69-Y):
720 NEXT Y
730 FOR X=0 TO 7:MOVE X*120+160,960:PRINTX+1:NEXT X
740 VDU 4
750 VDU 28,0,31,39,25
760 COLOUR 129:COLOUR 4:CLS
770 REPEAT
780 PROCguess
790 UNTIL J%=20
800 CLS:COLOUR 3:PRINT "Well Done you have found all the objects"
810 COLOUR 2:PRINT name1$: " found " :s1%: " toys" name2%: " found " :s2%: " toys"
820 COLOUR 0:PRINT " Press the <Space Bar> for another game.":
830 VDU 28,0,31,39,25
840 *FX 15,0
850 PROCsound
860 REPEAT UNTIL GET=32
870 RUN
880 END
890 DEFPROCguess
900 VDU 23,1,0:0:0:0:
910 CLS:PRINT SPC8:"Cedric and the Lost Toys" SPC12:COLOUR 2
920 IF p1%=0 THEN PRINT name1$:SPC5:"Score " :s1% ELSE PRINTname2$:SPC5:"Score " :s2%
930 COLOUR 0:PRINT "Enter your first guess":SPC3:COLOUR 3
940 s$=GET$:IF s$="Q" THEN PROCquit ELSE IF ASC(s$)<56 OR ASC(s$)>49 THEN 940
950 PRINT s$: " ":
960 t$=GET$:IF ASC(t$)>69 OR ASC(t$)<65 THEN 960
970 PRINT t$:COLOUR 0
980 GCOL 0,2:PROCcheck
990 IF fa%=1 THEN VDU 4:CLS:GOTO 910
1000 ba$=b$
1010 p=ob%(t,s):pb=t:pa=s
1020 VDU 23,1,0:0:0:0:
1030 PRINT "Enter your second guess":SPC3:COLOUR 3
1040 s$=GET$:IF s$="Q" THEN PROCquit ELSE IF ASC(s$)<56 OR ASC(s$)>49 THEN 1040
1050 PRINT s$: " ":
1060 t$=GET$:IF ASC(t$)>69 OR ASC(t$)<65 THEN 1060
1070 PRINT t$:COLOUR 0
1080 GCOL 0,2:PROCcheck
1090 IF fa%=1 THEN VDU 4:CLS:GOTO 1030
1100 bb$=b$
1110 q=ob%(t,s):qb=t:qa=s
1120 IF qa=pa AND qb=pb THEN VDU 4,7:CLS:GOTO 1030
1130 IF p=q THEN CLS:J%=J%+1:ob%(qb,qa)=0:ob%(pb,pa)=0:PROCsound:PROCscore:ENDPROC
1140 CLS:PRINT " Press the <Space Bar> to continue."
1150 VDU 23,1,0:0:0:0:
1160 REPEAT UNTIL GET=32
1170 VDU 5:GCOL 0,0
1180 MOVE pa*120,1024-pb*133-30:PRINTba$
1190 MOVE qa*120,1024-qb*133-30:PRINTbb$
1200 VDU 4
1210 p1%=p1%+1:IF p1%>1 THEN EN p1%=0
1220 ENDPROC
1230 END
1240 DEFPROCcheck
1250 t=ASC(t$)-64:s=ASC(s$)-48
1260 fa%=0
1270 MOVE s*120,1024-t*133-30
1280 VDU 5
1290 IF ob%(t,s)=0 THEN fa%=1:VDU 7:ENDPROC
1300 b$=a$(ob%(t,s))
1310 PRINTb$
1320 VDU 4
1330 ENDPROC
1340 DEFPROCsound
1350 RESTORE
1360 DATA 105,105,109,105,121,105
1370 FOR X=1 TO 6
1380 READ D
1390 SOUND 1,-15,D,1
1400 NEXT X
1410 ENDPROC
1420 DEFPROCInstructions
1430 CLS:COLOUR 2:PRINTSPC 1:a$(120):SPC(5):COLOUR 1:PRINT "Cedric and the lost toys":COLOUR 2:PRINTSPC(5):a$(121)
1440 PRINTTAB(8):"=====
1450 COLOUR 3:PRINT " A game of memory for two players."
1460 COLOUR 2:PRINT " Poor old Cedric has lost his toys and doesn't know where to find them. Can you help him ?"
1470 VDU 28,0,31,39,10
1480 PROCdisplay
1490 CLS
1500 COLOUR 1:PRINT " The toys are hidden in a board which is labelled 1 to 8 a cross and A to E down."
1510 PRINT " You can look at what is in a square by typing in the coordinates (number first)":
1520 PRINT " You can only look at the contents of two squares at once, and if they are the same, you will score 1 and get another turn."
1530 PRINT " If they are not identical, they will disappear and the second player must take their turn."
1540 ENDPROC
1550 DEFPROCscore
1560 IF p1%=0 THEN s1%=s1%+1 ELSE s2%=s2%+1
1570 ENDPROC
1580 DEFPROCquit
1590 CLS:PRINTSPC(16):"You quit":COLOUR 2:PRINTname1$: " scored :- " :s1%
1600 COLOUR 0:PRINTname2$: " scored :- " :s2%
1610 FOR X=1 TO 8:FOR Y=1 TO 5:t$=CHR$(Y+64):s$=CHR$(X+48)
1620 GCOL 0,2:PROCcheck:NEXT Y,X
1630 VDU 4:COLOUR 2:PRINT " Press the <Space Bar> for another game."
1640 VDU 23,1,0:0:0:0:
1650 *FX 15,0
1660 REPEAT UNTIL GET=32
1670 RUN
1680 ENDPROC
1690 DEFPROCdisplay
1700 CLS:T=1:FOR X=1 TO 39 STEP 4:FOR Y=1 TO 20 STEP 2:COLOUR 1:PRINTTAB(X,Y):a$(RND(20)):T=T+1:NEXT Y,X
1710 FOR X=1 TO 2:PROCsound:NEXT X
1720 TIME=0:REPEAT UNTIL TIME>100:COLOUR 1
1730 ENDPROC

```

*This listing is included in this month's cassette tape offer. See order form on Page 61.*



# electron user

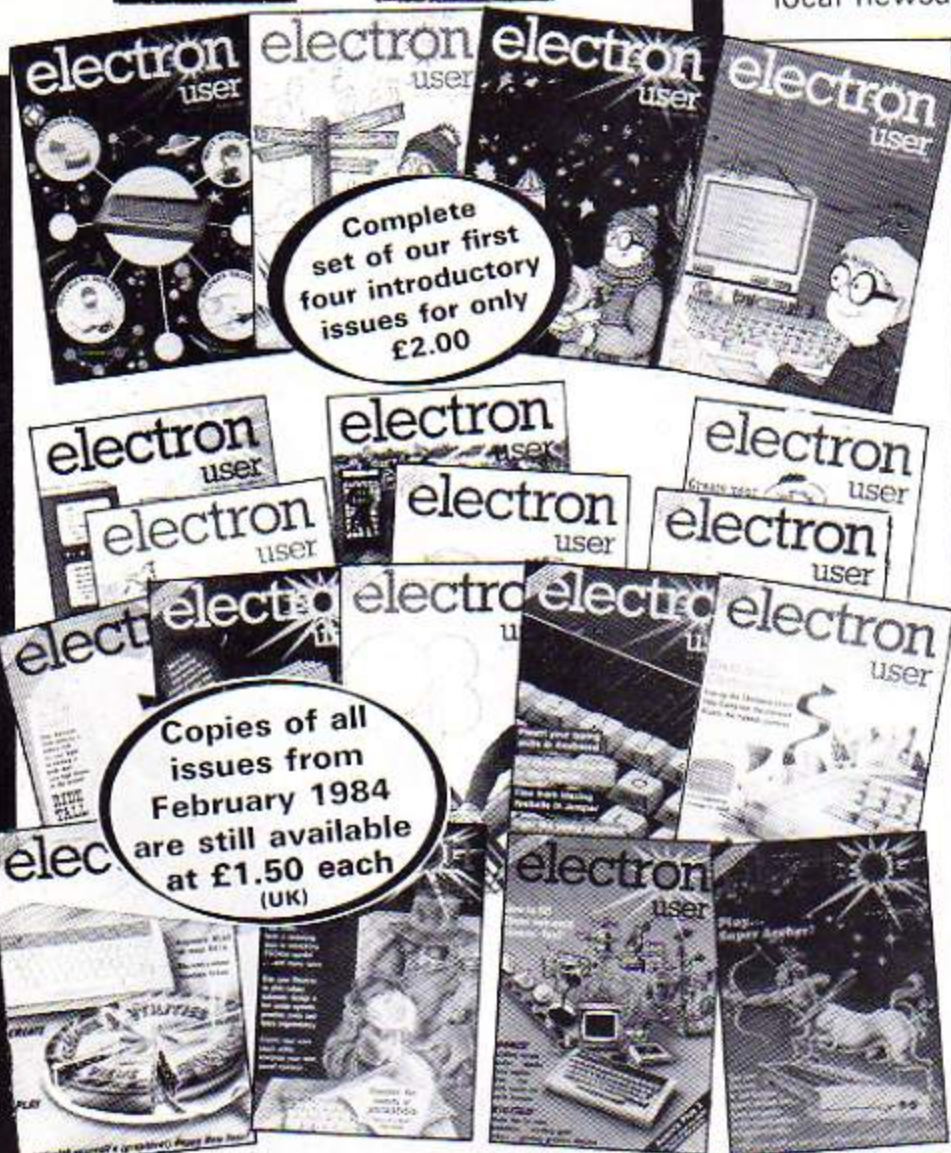


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|                          | December 1984                | 3017 | <input type="checkbox"/> |
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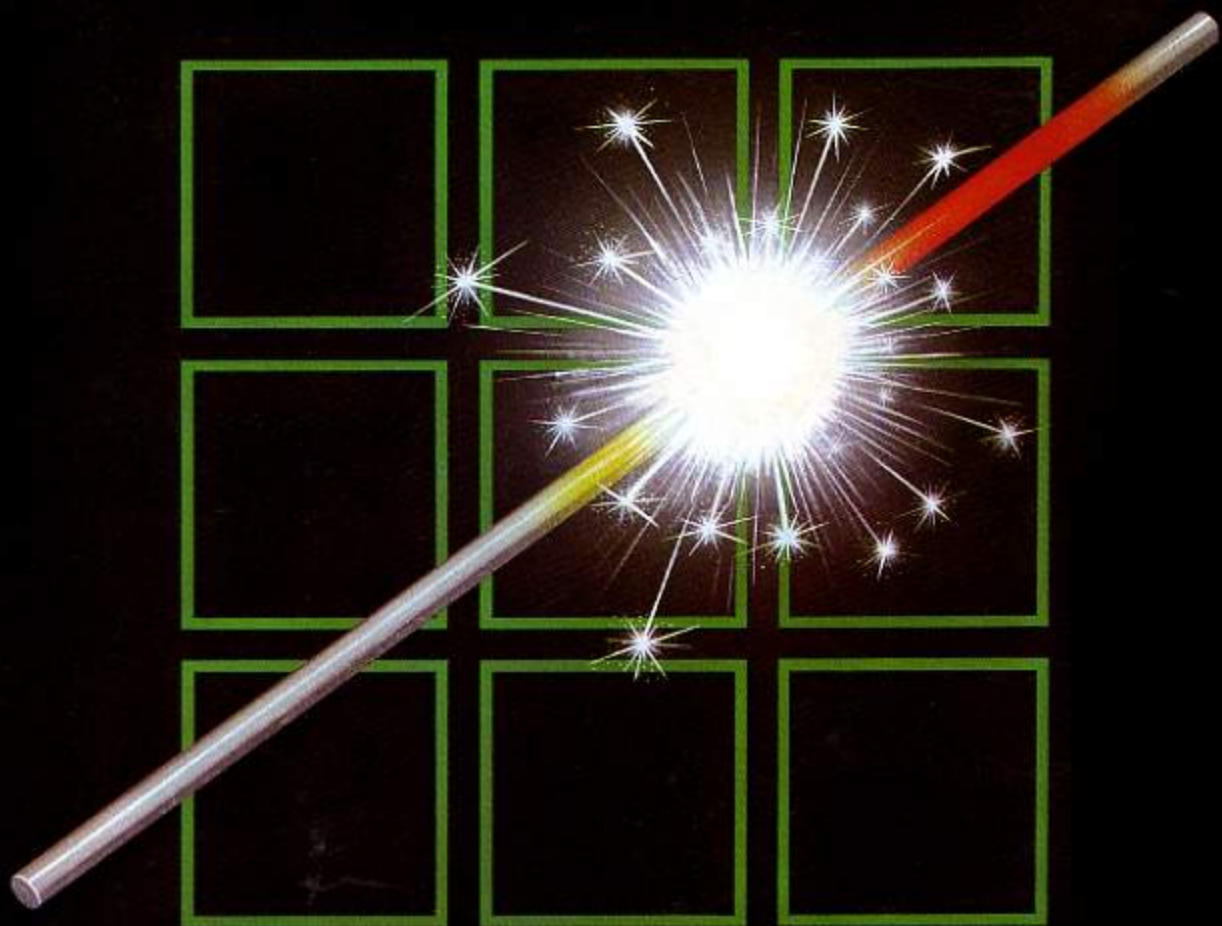
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